

Addendum Report for the AREE 70, AREE 69B, and Cold Spring Brook Supplemental Sampling Event

Base Realignment and Closure Environmental Evaluation (BRAC EE) Fort Devens, Massachusetts

Submitted to

U.S. Army Environmental Center (USAEC) Aberdeen, Maryland

Revision 0 November 1995

Arthur D. Little, Inc. Acorn Park Cambridge, Massachusetts 02140-2390

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Submitted to

U.S. Army Environmental Center (USAEC) Aberdeen, Maryland

Task Manager, Richard Waterman Da

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### List of Acronyms and Abbreviations

AOC Area of Concern

AREE Area Requiring Environmental Evaluation

B&M Boston & Maine

Cl- Chloride

DDD 1,1-dichloro-2, 2-bis(p-chlorophenyl)ethane

DDE Dichlorophenyl-dichloro-ethylene DDT Dichlorodiphenyltrichloroethane

DOO Data Quality Objective

HPLC High-Performance Liquid Chromatography

IRDMIS Installation Restoration Data Management Information System

MCP Massachusetts Contingency Plan

PCB Polychlorinated biphenyl PID Photoionization Detector

QAPjP Quality Assurance Project Plan

SA Study Area SO<sub>4</sub> Sulfate

SOP Standard Operating Procedure SVOC Semivolatile Organic Compound

TOC Total Organic Carbon

TPHC Total Petroleum Hydrocarbons

TSS Total Suspended Solid

USA-### United States Army - Standard Operating Procedure Number

USAEC United States Army Environmental Center

UST Underground Storage Tank

### **Executive Summary**

Basewide environmental investigations were performed on Fort Devens from 1993 through 1995 in support of Base Realignment and Closure Environmental Evaluation activities. Seven basewide programs or Areas Requiring Environmental Evaluation (AREEs), were investigated during this time period. Supplemental sampling at select sites was recommended in the final reports for two AREEs, AREE 70 (Storm Sewer Evaluation) and AREE 69 (Past Spill Sites). This supplemental sampling event was performed in support of those recommendations.

Of the 55 systems investigated in the Storm Sewer Evaluation, 11 were recommended for further action. Seven of the systems requiring further action were included in the ongoing Lower Cold Spring Brook Site Investigation (Study Area [SA] 73). The remaining 4 systems, 9, 14, 21, and 25 were investigated as part of this sampling event. The objective of this sampling event was to determine if elevated concentrations of contaminants detected in these storm sewers in 1993 were anomalies or the result of a continual contaminant source. One site from the Past Spill Sites study required further investigation, AREE 69B at Building 2602. The five existing ground water monitoring wells at the site were resampled to determine any changes in the concentration of total petroleum hydrocarbons (TPHC).

Samples in each storm sewer system were analyzed for contaminants that were identified as being elevated in the 1993 storm sewer evaluation. The 1995 sample results were compared to the 1993 results. Of the four storm sewer systems investigated in this supplemental study, samples collected from systems 9 and 21 indicated a substantial decrease in contamination and these systems are recommended for no further action. Systems 14 and 21 indicated reduced concentrations of contaminants of concern or no changes in the concentration of contaminants. The 1995 sampling at System 14, which was a system of concern in 1993, indicated that the contaminants detected in 1993 are either no longer elevated or their concentration remain unchanged. The 1995 sample results from System 25 indicate reduced concentrations of metals, which were the contaminants of concern in 1993, and the concentration of semivolatile organic compounds have not increased over time. As a result, both systems 14 and 25 are recommended for no further action.

The ground water sampling event at AREE 69B indicated a different pattern of contamination when compared to the 1993 data. The concentration of TPHC decreased in the wells located immediately adjacent to the existing underground storage tanks (USTs). However, a strong petroleum odor and sheen was detected in one of the wells closest to the tank, well UST-01. The concentration of TPHC increased in the farthest downgradient well. All other wells indicated no change or a decrease in the concentration of TPHC. Additional sampling is recommended for these wells combined with an assessment of the local ground water to determine if there are any further fluctuations in the data.



## **Executive Summary**

As part of this investigation, five additional surface water and sediment samples were collected in Cold Spring Brook near Storm Drain System Number 9. These samples were collected to support the ongoing Cold Spring Brook investigation (SA 73). The data associated with Cold Spring Brook will be analyzed and reported on by ABB Environmental Services as part of the SA 73, Lower Cold Spring Brook Site Investigation.

#### 1.0 Introduction

A Supplemental Sampling Event was performed in response to recommendations from the Area Requiring Environmental Evaluation (AREE) 70 and AREE 69 final reports. In addition, samples were collected around the outfall of Storm Sewer System 9 in Cold Spring Brook to support the ongoing Study Area (SA) 73, Lower Cold Spring Brook Site Investigation. The sample event presented in this report was performed in accordance with the Memorandum Work Plan, AREE 70, AREE 69B, and Cold Spring Brook Supplemental Sampling Event, Base Realignment and Closure Environmental Evaluation (BRAC EE) Fort Devens, Massachusetts, Revision 0, June 1995 (Arthur D. Little, 1995a).

#### AREE 70

The initial Storm Sewer Evaluation performed in 1993 studied 55 systems, 11 of which were recommended for further investigation. These systems were recommended for further investigation because the storm water and sediment samples indicated concentrations of contaminants above expected concentrations. Seven systems numbers 1, 2, 3, 4, 5, 6, and 7 were recommended for inclusion in the ongoing SA 73 Lower Cold Spring Brook Site Investigation. The remaining four systems numbers 9, 14, 21, and 25 were included in this investigation.

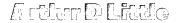
#### AREE 69

The Past Spill Sites Study, AREE 69, was conducted during the summer of 1993. AREE 69B investigated a fuel oil spill from an existing underground storage tank (UST) at Building 2602. Based upon elevated concentrations of total petroleum hydrocarbons (TPHCs) in the ground water monitoring wells surrounding the UST, additional sampling was recommended. The five existing ground water monitoring wells at AREE 69B were sampled during this event.

#### 1.1 Project's Objective

#### AREE 70

The objective of this Supplemental Sampling Event was to determine whether the concentrations of contaminants found during the previous Storm Sewer Study were still elevated above expected concentrations. The 1993 sampling event indicated that concentrations of certain contaminants were elevated above expected levels within storm sewer systems 9, 14, 21, and 25. These systems had no known associated sources of contamination such as AREEs, SAs, and Areas of Concern (AOCs) that would contribute to the elevated concentrations of the detected contaminants. As a result, the 1995 sampling event targeted those areas in the storm sewer system that had elevated contamination in 1993. Only those sample points that indicated elevated contamination were sampled. Sampling targeted the contaminants that were elevated in 1993. Both surface water and sediment samples were included in the sampling.



#### AREE 69

The objective of the Supplemental Sampling Event at AREE 69B was to determine if there were any fluctuations in the TPHC contamination detected in the ground water monitoring wells located near Building 2602. In 1993, samples from two wells, UST-01 and UST-02, located near the existing UST indicated TPHC contamination exceeding Massachusetts Contingency Plan (MCP) Method 1 GW-1 standards. The same monitoring wells sampled in 1993 were resampled in 1995 to determine if the contamination is still elevated above regulated levels and the disposition of the contamination.

# Lower Cold Spring Brook Site Investigation SA 73

ABB Environmental Services, Inc., requested that Arthur D. Little, Inc., to perform additional sampling in the vicinity of the outfall of Storm Sewer System Number 9 and in Cold Spring Brook. The results of this sampling will be used to support the SA 73 Lower Cold Spring Brook Site Investigation. Five locations were sampled for surface water/sediment and ponded water. These samples were analyzed for semivolatile organic compounds (SVOCs), pesticides, polychlorinated biphenyls (PCBs), inorganics, total organic carbon (TOC), and TPHC. In addition, analyses of water samples included dissolved metals, total suspended solids (TSS), chloride (Cl-), sulfate (SO<sub>4</sub>), total hardness, and alkalinity. This report does not include the laboratory's analytical data for these samples. All sample results and laboratory data was submitted to ABB Environmental Services, and will be included in the SA 73 Lower Cold Spring Brook Site Investigation report.

### 1.2 Field Investigation Techniques

Sediment, surface water, and ground water samples were collected from the above sample locations and were analyzed by a United States Army Environmental Center (USAEC) performance-demonstrated laboratory for the specified compounds as outlined in Table 1. Field work was conducted on July 10 and 11, 1995. If the storm sewer was dry, water samples were not collected. All samples were collected in accordance with Standard Operating Procedures (SOPs) which are included in the Final Quality Assurance Project Plan (QAPjP), Fort Devens, Massachusetts, Volumes I and II (Arthur D. Little, Inc., 1993b, 1993c). Quality Assurance samples were collected in accordance with the QAPjP during this Supplemental Sampling Event.

#### 1.2.1 Surface Water Sampling

The USAEC SOP for surface water sampling, USA-1001, was followed during this sampling event. Surface water samples were collected from two-thirds the depth below the water surface, when possible. The surface water samples were collected before collecting the sediment sample. All sampling equipment was decontaminated prior to use following the procedure outlined in ADL-1009. All sample bottles were triple rinsed with water representative of that being sampled prior to being filled with

the sample. A stainless-steel bomb sampler was used to collected water samples from manholes. If the sample was collected from a water column of less than 12 inches, such as an outfall, the sample container was directly submerged into the water column, without disrupting the turbidity of the sample. Following collection, each sample was wiped dry and placed on ice for shipment (Arthur D. Little, 1993b).

#### 1.2.2 Sediment Sampling

Sediment samples were collected from manholes using a stainless-steel Pulnar grab sampler. If the location was an outfall, the sample was collected with a stainless-steel spoon. Following collection, each sample was wiped dry and placed on ice for shipment (Arthur D. Little, 1993b).

### 1.2.3 Ground Water Sampling

Arthur D. Little's sampling team followed USAEC SOP USA-1011 for ground water monitoring. The headspace of the well was monitored with a photoionization detector (PID) as soon as the well cap was removed and every 15 minutes thereafter. The ground water surface elevation and the depth to well bottom was then recorded. If free phase product existed, then an interface probe was used to measure the level of petroleum on top of the ground water. All measurements were made in accordance with SOP ADL-4012. The purge volume was computed and the well was purged until five unit volumes were removed. During the purge process, temperature, pH, and conductivity were recorded at five intervals. If during the purge process the well went dry and the ground water recovery rate was fast, the well was evacuated one more time before sampling. If the well did not have a fast recovery rate, then the ground water was sampled as soon as a sufficient volume was available. Purge water was collected in 55-gallon drums. Following ground water collection, each sample was wiped dry and placed on ice for shipment. For a more detailed description of this process, refer to the SOP, USA-1011 (Arthur D. Little, 1993c).

#### 1.2.4 Data Quality Objectives and Quality Assurance/Quality Control

Every effort was taken to minimize the impact of comparing the sample data from 1993 to that collected in 1995. The data quality objectives (DQOs) that were used during this investigation were the same as applied to the AREE Supplemental Site Evaluations and to the AREE 70 investigation. In addition, the same quality assurance program presented in the *Final Quality Assurance Project Plan, Fort Devens, Massachusetts, Volumes I and II* (Arthur D. Little, Inc., 1993b, 1993c) applied to this sampling event. Furthermore, to ensure data quality and consistency between the sampling events, samples were collected using the same sample techniques that were used during the 1993 sampling event. To further reduce potential variability in the data, the same subcontracted USAEC performance-demonstrated laboratory and laboratory methods were used for both sampling events. As a result, the main variable in the data is the temporal variable for comparing data collected between 1993 and 1995.



### 2.1 Storm System Number 9

#### 2.1.1 System Description

This is an extensive system that drains residential areas, unpaved railroad tracks, and unpaved storage yards located near the intersection of Bates Service Road and Cavite Street. The system runs east along Cavite Street, then drains south along Saratoga Street and discharges into Cold Spring Brook at the junction of Saratoga Street and Barnum Road. This system drains areas used for a variety of activities including industrial, residential, and commercial.

During the AREE 70 investigation in 1993, two compounds were detected and indicated as isolated elevated analytes. The semivolatile compound pyrene and the pesticide dichlorodiphenyl trichloroethane (DDT). Both compounds were detected in the sample collected from location 9D, which is located adjacent to the Buena Vista Housing Area. This sample location is a manhole and there are no known sources of contamination in the area. Additional sampling at location 9D in System Number 9 was recommended in the final AREE 70 report to determine if the elevated concentrations of pyrene and DDT were from a continual source.

# 2.1.2 Sampling Procedure and Observations

One sediment sample was collected at Storm Sewer System 9D; there was no water available to sample. The sediment sample consisted of a considerable amount of organic matter including leaves and pine needles. The sediment was a silty sand. The sample was collected with a Pulnar Grab Sampler from 0 to 5 inches in depth. Prior to filling the sample bottles, the sediment sample was mixed into a composite using a stainless-steel bowl and spoon. The sediments samples were analyzed for pesticides, PCBs, and SVOCs. See Figure 1 for a map depicting sample locations and results.

#### 2.1.3 Nature and Extent of Contamination

Pyrene and DDT were the only compounds of concern for System Number 9. The concentration of pyrene was 3.0  $\mu$ g/g and DDT was detected at .0035  $\mu$ g/g. Both of these concentrations are below the detected levels from the 1993 sampling event. Refer to Table 2 for a comparison of the 1993 and 1995 data.

#### 2.1.4 Conclusions and Recommendations

In 1993, pyrene and DDT were the only outliers identified in this storm sewer system. The cause of the elevated concentrations of these compounds is unknown. This sample location is in the middle of the Buena Vista Housing areas and there are no AOCs, SAs, nor AREEs adjacent to this location. As a result, confirmatory sampling was recommended to determine if these contaminants were anomalies. The 1993 sampling event suggested that the contaminants could be a result of runoff from grassy areas and roadways.



### 2.0 Storm Sewer System Evaluation (AREE 70)

The 1995 data does not indicate that there is a continual source of contamination to this storm sewer system. The pyrene concentration has decreased significantly over time from 13 to 3.0  $\mu$ g/g. DDT has also decreased in concentration from 0.022 to .0035  $\mu$ g/g.

Comparison of data collected from 1993 and 1995 indicates that there is not a continual source of contamination to sample location 9D in Storm Sewer System Number 9. Therefore, it is assumed that the contamination detected in 1993 may have occurred from roadway and grassy area runoff. This data indicates that the 1993 detection was an anomalous reading since the concentrations of these analytes have decreased over time. This site is recommended for no further action.

# 2.2 Storm System Number 14

#### 2.2.1 System Description

This system drains an area occupied by barracks and an unpaved vehicle storage area located at the junction of Market and Carey Streets. Drainage flows from south to north and discharges through two outfalls into the Shepley's Hill Landfill area. The two outfalls are designated 14A and 14C.

Elevated concentrations of metals and pesticides were detected in the samples from the two outfalls of System 14 during the 1993 AREE 70 sampling event. Storm Sewer System 14 was designated as a system of concern because it had three or more compounds exceeding expected concentrations. The sediment samples had 1,1-dichloro-2, 2-bis(p-chlorophenyl)ethane (DDD), dichlorophenyl-dichloro-ethylene (DDE) and DDT exceeding expected levels and the storm water samples had DDD, DDE, DDT, total pesticides, arsenic, barium, lead, and vanadium exceeding expected concentrations. The 1993 sampling event did not identify a definite source for these contaminants. AREE 61Z, building 202, was identified as a potential source, but it was determined to be an unlikely contributor because these contaminants would be an unlikely result of motor pool operations. As a result, additional sampling of the two outfall locations 14A and 14 C was recommended. See Figure 2 for a map depicting the sample locations.

#### 2.2.2 Sampling Procedures and Observations

One sediment sample was collected from each storm sewer system outfall 14A and 14C. There was no water available to sample at either outfall. The sediment at outfall 14A was moist, dark brown, silty sand. The sample was collected inside the mouth of the outfall from 0 to 6 inches deep. The sediment at outfall 14C was light yellow/brown, coarse sand and gravel, with a trace of silt. The sample was collected about 10 feet from the mouth of the outfall, where the sediments settled. The sample was collected from 0 to 4 inches in depth. The samples were mixed in a stainless-steel bowl with a spoon to obtain a composite. Samples collected from outfalls 14A and 14C were analyzed for metals and pesticides.

#### 2.2.3 Nature and Extent of Contamination

Only sediment samples were analyzed for outfalls 14A and 14C. Samples were analyzed for DDD, DDE, DDT, arsenic, barium, lead, and vanadium. DDD and DDE, primary column detections on the High-Performance Liquid Chromatography (HPLC) column, were not confirmed on the second column at location 14A. This indicates that the levels are interferences and, therefore, are determined to be non-detections. At sample location 14C, DDD, DDE, and DDT concentrations were not detected.

At sample location 14A, arsenic and lead were detected at 15 and 140  $\mu$ g/g, respectively. This appears to be a slight increase in concentration from the 1993 sampling event. Barium and vanadium were detected at 67.5 and 40.5  $\mu$ g/g, respectively. At sample location 14C, arsenic, barium, lead, and vanadium were detected at 7.97, 24.9, 10.1, and 14.2  $\mu$ g/g respectively. These concentrations are below the levels detected in 1993. Refer to Table 2 for a comparison of the data.

#### 2.2.4 Conclusions and Recommendations

The media of primary concern at the outfalls for System 14 is the sediment since there was no water for sampling and data comparison. The 1993 sampling event identified the concentrations of DDD, DDE, and DDT as being elevated above the expected levels for these compounds. The 1995 sampling data indicated a significant decrease in the concentrations of these compounds from 1993. DDT was detected and confirmed at  $0.105 \,\mu\text{g/g}$  at sample location 14A. This level is below the value reported in 1993. The 1995 result was flagged for poor ending calibration results due to interferences present in the samples; this indicates that the quantitation should be considered as an estimate.

Arsenic concentrations increased slightly at both outfalls sampled at System 14. The concentration of arsenic at outfall 14A was 9.51 µg/g in 1993 and 15 µg/g in 1995. The concentration of lead at outfall 14C was 3.4 µg/g in 1993 and is 7.97 µg/g in 1995. Lead concentrations increased from 52 µg/g in 1993 to 140 µg/g in 1995 at outfall 14A and decreased in concentration at 14C, having dropped from 45 µg/g to 10.1 µg/g. Concentrations of barium and vanadium are either the same as in 1993 or have decreased in concentration at both outfalls.

Examining the acceptable limits for determining the comparability of data under the quality assurance program, it is reasonable to assume a 100 percent relative percent difference when examining the data and comparing data sets. This assumption is reasonable given that two years have passed since the collection of the first data set. When examining the concentration of arsenic and lead using a 100 percent relative percent difference, the concentrations of arsenic and lead have not changed significantly over time. Barium and vanadium do not appear to be elevated significantly.

### 2.0 Storm Sewer System Evaluation (AREE 70)

Storm Sewer System 14 is recommended for no further action. The concentration of pesticides has decreased over the last two years. Furthermore, the metal contaminants are not elevated significantly to cause concern and arsenic is a naturally occurring element in the region. As a result, there does not appear to be a continual source of contamination to Storm Sewer System 14.

### 2.3 Storm System Number 21

#### 2.3.1 System Description

This system collects runoff from the south side of the parade ground and drains to the east, under MacArthur Avenue and discharges into Willow Brook. This system is comprised of three subsystems that all drain into Willow Brook.

In 1993, chemical analyses of the samples collected from the system's outfall, location 21A, showed elevated concentrations of semivolatile compounds, in particular anthracene in sediment. This system was identified as an isolated elevated analyte system since only anthracene was detected as an outlier to the data set. However, sample location 21A was the sample point where the highest SVOC concentrations were detected. The 1993 sampling event did not identify a definite source for the SVOCs. Additional sampling was recommended for sample point 21A to identify whether there is a continual source for the SVOCs.

#### 2.3.2 Sampling Procedures and Observations

One sediment sample was collected from Storm Sewer System 21A; there was no water available to sample. The sediment was light brown, coarse sand, with a trace of fine gravel. The sample was collected 1 foot from the outfall, about 0 to 3 inches deep, at the edge of Willow Brook. The brook was dry and had litter, discarded chairs and toys, strewn about in it. The sediment was collected with a stainless-steel spoon and well mixed in a stainless-steel bowl. The composite samples were analyzed for SVOC. See Figure 3 for a map depicting the sample location.

#### 2.3.3 Nature and Extent of Contamination

The main SVOC of concern is anthracene. This compound was detected at a concentration of  $1.0 \,\mu\text{g/g}$ . All of the other SVOCs of concern were detected at or near the detection limit of the analytical instrument. Refer to Table 2 for a comparison of the data.

#### 2.3.4 Conclusions and Recommendations

Comparison of data collected in 1993 and 1995 indicates that there is not a continuous source of contamination to Storm Sewer System 21. Anthracene decreased in concentration from 11  $\mu$ g/g to 1.0  $\mu$ g/g. In addition, all other SVOCs decreased in concentration from 1993 to 1995. This data indicates that the 1993 detection was an anomalous reading since the concentrations of these analytes have decreased over time. This site is recommended for no further action.

### 2.4 Storm System Number 25

#### 2.4.1 System Description

This system drains a wooded area located to the south of Lovell Trailer Park, where Hoff and Lovell Streets intersect. The system flows to the east and discharges into the Nashua River via a drainage swale.

The 1993 sampling event detected selenium as an isolated elevated analyte. However, there were also a number of SVOCs detected at the outfall. The Final AREE 70 report did not indicate that selenium was of concern because there was no identifiable source of selenium in the area. Additional sampling was recommended, however, to determine whether the concentrations of SVOCs were from a continual source.

# 2.4.2 Sampling Procedures and Observations

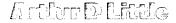
One sediment sample was collected at the outfall of Storm Sewer System 25A and one sediment sample was collected from beneath the storm sewer grate at sample location 25B. No water was present to sample at either location. The sediment sample at sample location 25A was collected using a stainless-steel spoon from the top 0 to 6 inches. The sample was mixed in a stainless-steel bowl. The top inch of the sediment consisted of coarse sand and fine gravel, underlain by primarily silt with some sand. The sediment sample at 25B was collected with a Pulnar Grab Sampler. The sample was collected from the top 2 inches of sediment. There was a considerable amount of organic matter including pine needles at the sample point. The sediment was hard, dry, and primarily silt with some coarse sand. The samples from both locations were analyzed for SVOCs and metals. See Figure 4 for a map depicting the sample locations.

#### 2.4.3 Nature and Extent of Contamination

Selenium, the isolated elevated analyte in the 1993 sampling, was reported at the detection limit of the analytical instrument at a concentration of 0.45  $\mu$ g/g. A number of SVOCs were detected in samples collected from sample locations 25A and 25B. Sample point 25A had slightly higher concentrations of SVOCs with acenaphthylene detected at 9  $\mu$ g/g, benzo(a)anthracene at 60  $\mu$ g/g, benzo(a)pyrene at 30  $\mu$ g/g, chrysene at 50  $\mu$ g/g, fluoranthene at 2  $\mu$ g/g, and phenanthrene at 100  $\mu$ g/g. Sample point 25B had lower concentrations of SVOCs with acenaphthylene detected at 9  $\mu$ g/g, benzo(a)anthracene at 40  $\mu$ g/g, benzo(a)pyrene at 10  $\mu$ g/g, chrysene at 40  $\mu$ g/g, fluoranthene at 50  $\mu$ g/g, and phenanthrene at 30  $\mu$ g/g. Refer to Table 2 for a comparison of the 1993 and 1995 data.

#### 2.4.4 Conclusions and Recommendations

Storm Sewer System 25 had one outlier for selenium when it was sampled in 1993. The system also had a number of SVOCs detected within the system. Additional sampling was recommended to determine whether there was a continual source of contamination to System 25.



### 2.0 Storm Sewer System Evaluation (AREE 70)

Storm Sewer System 25 was identified in 1993 as an isolated elevated analyte system for selenium. Selenium was not detected in the 1995 samples. Selenium was reported at the instrument detection limit at a concentration of 0.45 µg/g. As a result, the selenium detected in 1993 appears to be an anomaly in the data set and there is no continual source of selenium to the system. The data appears to indicate that some SVOCs have increased in concentration from 1993. Specifically, acenaphthylene, benzo(a)anthracene, benzo(a)pyrene, chrysene, and phenanthrene all increased in concentration since 1993 at both sample points 25A and 25B. Fluoranthene decreased in outfall 25A, but increased slightly in outfall 25B.

Examining the acceptable limits for determining the comparability of data under the quality assurance program, it is reasonable to assume a 100 percent relative percent difference when examining the data and comparing data sets. This assumption is conservative for SVOCs given that two years have passed since the collection of the first data set. Typically, an even higher relative percent difference could be applied to account for the time between sampling events. When examining the concentration of the SVOCs using a 100 percent relative percent difference, the concentrations of these compounds has not changed significantly over time. Therefore, the SVOCs do not appear to be elevated significantly.

Storm Sewer System 25 is located within the U.S. Army Enclave at Fort Devens, an area being retained by the Army. There is no known continual source of contamination to System 25. All buildings in the area and petroleum storage tanks have been removed. Furthermore, the system does not service any existing structures in the area. As a result, the detection of SVOCs are, most likely, residual contaminants from past operations in the area. In addition, when comparing the concentrations of the SVOCs to the entire AREE 70 data set, the concentrations are not high enough to identify the system as a system of concern. As a result, no further action is recommended for Storm Sewer System 25.

# 3.0 Past Spill Sites Study (AREE 69B)

### 3.1 Background

AREE 69B investigated a spill at building 2602. The initial spill was reported in 1990 as the result of an underground fuel tank overfill. This site was given the designation AREE 69B during the initial AREE 69 study. The AREE 69 Supplemental Site Evaluation, performed in 1994, did not identify any residual contamination in the soils around the site. During the sampling of the existing ground water monitoring wells UST-01 and UST-02, located upgradient and north of the spill area, next to the existing USTs, free-phase product was identified. All five monitoring wells, GE-01, GE-02, GE-03, UST-01, and UST-02, were sampled to determine fluctuations in petroleum contamination in the ground water (Arthur D. Little, 1993d, 1995b). During the 1994 sampling event, monitoring wells UST-01 and UST-02 had the highest concentration of TPHC, exceeding MCP limits. See Figure 5 for a map depicting the location of the monitoring wells.

As a result of the 1994 sampling event it was recommended that the five existing ground water monitoring wells be resampled to determine any fluctuations in the TPHCs and tested for the presence of free-phase petroleum product.

### 3.2 Sampling Procedures and Observations

All five wells at AREE 69B, including GE-01, GE-02, GE-03, UST-01, and UST-02, were sampled for TPHCs on July 11, 1995. The sampling procedures discussed in section 1.2.3 of this report were followed. In addition, the wells were tested for free-phase product. During the sampling, a strong petroleum odor and sheen was identified in the purge water for UST-01. No odor or sheen was identified in the other ground water monitoring wells.

#### 3.3 Nature and Extent of Contamination

The ground water monitoring wells located closest to the UST are UST-01 and UST-02. These wells had TPHC detections of 397 and 110 µg/L, respectively. The downgradient wells GE-01, GE-02, and GE-03 had varying concentrations of TPHC. GE-01 detected TPHC at a concentration of 100 µg/L, the detection limit for TPHC. GE-02 detected TPHC at a concentration of 1,130 µg/L, and GE-03 detected TPHC at a concentration of 100 µg/L, the detection limit. Refer to Table 3 for a comparison of the data.



### 3.4 Conclusions and Recommendations

The data from the ground water monitoring wells sampled during the Supplemental Site Evaluation for AREE 69 sites showed that in 1994, the highest level of contamination was in the wells closest to the UST, wells UST-01 and UST-02. These wells exceeded the MCP limits for TPHC contamination in ground water. By comparison, the 1995 sampling event had only one well exceeding MCP limits, GE-02. This well is located the farthest from the UST. TPHC concentrations in well GE-02 increased from 290 to 1,130 µg/L. By comparison, TPHC concentration in monitoring well UST-01 decreased from 7,200 to 397 µg/L and TPHC in UST-02 decreased from 9,600 to 110 µg/L. However, a strong petroleum odor and a sheen were detected in monitoring well UST-01 during sampling. The TPHC concentrations in monitoring wells GE-01 and GE-03 decreased significantly or remained constant. Both wells detected TPHC at a concentration of 100 µg/L, which is the method detection limit.

A significant seasonal variance in the ground water levels in the monitoring wells was noted. Furthermore, when comparing the interseasonal variance from one year to the next, a significant difference in the ground water levels was noted. This area of Fort Devens is known to have wide variations in ground water levels. The bedrock in this area is relatively close to the surface and is not highly fractured. This area also has had a number of construction projects over the history of the base, including the construction of building 2602, that has most likely disturbed the regional ground water regime. As a result, it is difficult to make a definite conclusion regarding the potential for contamination existing at AREE 69B. Some contamination existing near UST-01 in the vicinity of the UST fill pipes is the most likely scenario. However, given the variability in the TPHC detection method and the variability in the ground water levels, it is unlikely that there is TPHC contamination farther downgradient that would be of concern. In addition, based upon the AREE 69B Supplemental Site Investigation, there were no other contaminants that exceeded MCP limits (Arthur D. Little, 1995b).

In order to ensure that there is no residual contamination at AREE 69B, the following actions are recommended:

- 1) Examine the water level measurements for wells UST-01, UST-02, GE-1, GE-2 and GE-3. Water levels were measured quarterly from 1992 to 1995. This data may give some insight into the local ground water flow.
- 2) Collect one additional round of ground water samples during the winter of 1995-96. The samples will be examined for TPHC, SVOCs, volatile organic compounds, metals, and PCBs/pesticides.

# 3.0 Past Spill Sites Study (AREE 69)

- 3) Examine the monitoring well construction logs/diagrams, if they exist, to determine the reliability of the wells.
- 4) Examine the tank installations as-built drawings, if they exist, and any associated monitoring results.

This data will be used in conjunction with previously collected data regarding the release at AREE 69B. A final determination regarding the site will be made after reviewing all data in aggregate.



### 4.0 Cold Spring Brook (Study Area 73)

The USAEC through ABB Environmental Services, Inc. requested that Arthur D. Little perform additional sampling of Storm Sewer System Number 9 and Cold Spring Brook. The results will be used in the ongoing SA 73 Lower Cold Spring Brook Site Investigation. The sample locations and sample parameters were specified by ABB. The results of this sampling event will be evaluated and reported by ABB. The following is a description of the sample locations. Figure 1 and Table 1 provide the sample locations and the sample identification for the samples collected. All sample results have been given to ABB and the data will be incorporated into the SA 73 site investigation and will not be reported in this document.

Samples were collected by Arthur D. Little's personnel and were submitted to a USAEC performance-demonstrated laboratory for analysis. The data was included in the Installation Restoration data Management Information System (IRDMIS) and sent to ABB Environmental Services.

# 4.1 Sites Requiring Further Investigation

The samples that were collected in proximity to the discharge area for Storm Sewer System 9 in the area of sample location 9A. Sediment and surface water samples were collected from each location with the exception of location 9L, where only sediment was collected. Each sample location is described in detail below:

- Within the ponded area downstream of the Boston & Maine (B&M) Railroad right-of-way, approximately 10 to 20 feet from the pond's outlet (location 9H).
- Within the low lying/wet area immediately upstream (west) of the B&M Railroad right-of-way (location 9L).
- Within the channel of Cold Spring Brook upstream of its final passage under Patton Road (i.e., west of Patton Road, location 9J).
- Within the drainage swale north of Dakota Street (i.e., upstream of the culvert that runs under Dakota Street, location 9K).
- At the piped outlet of Storm Sewer System 9 at the edge of the asphalt parking lot adjacent to the Commissary (location 9L).



#### 5.0 Selected References

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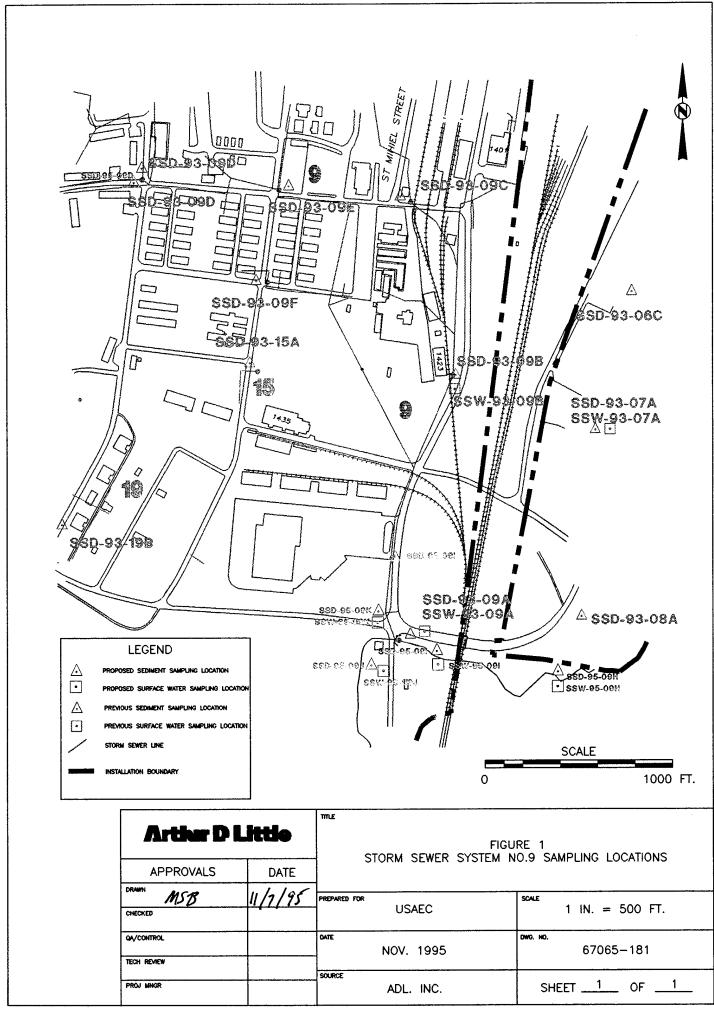
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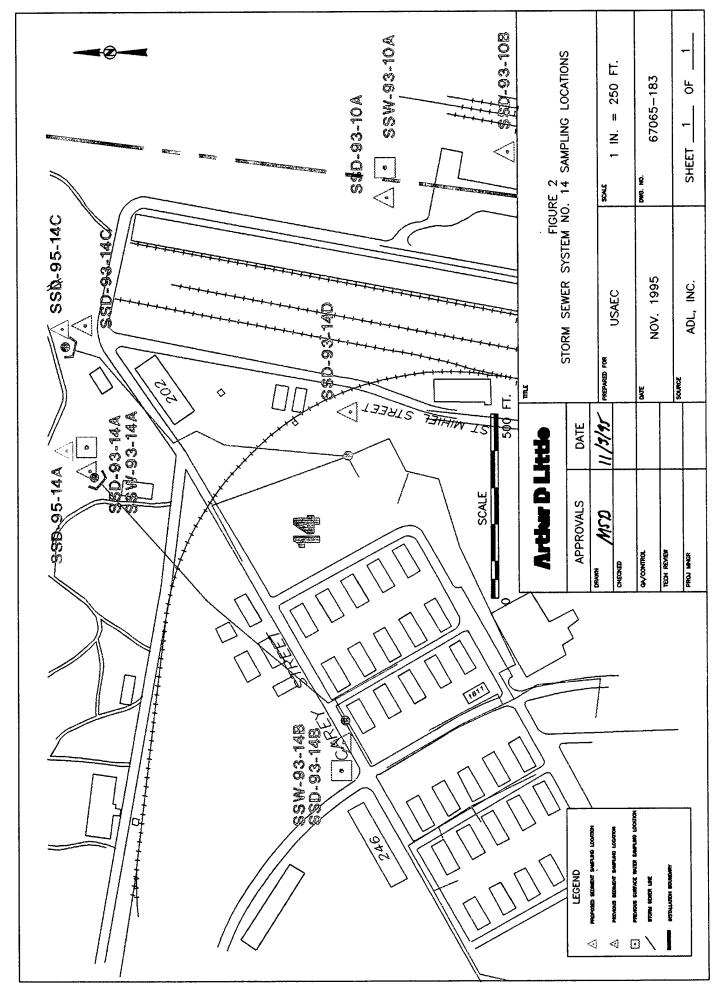
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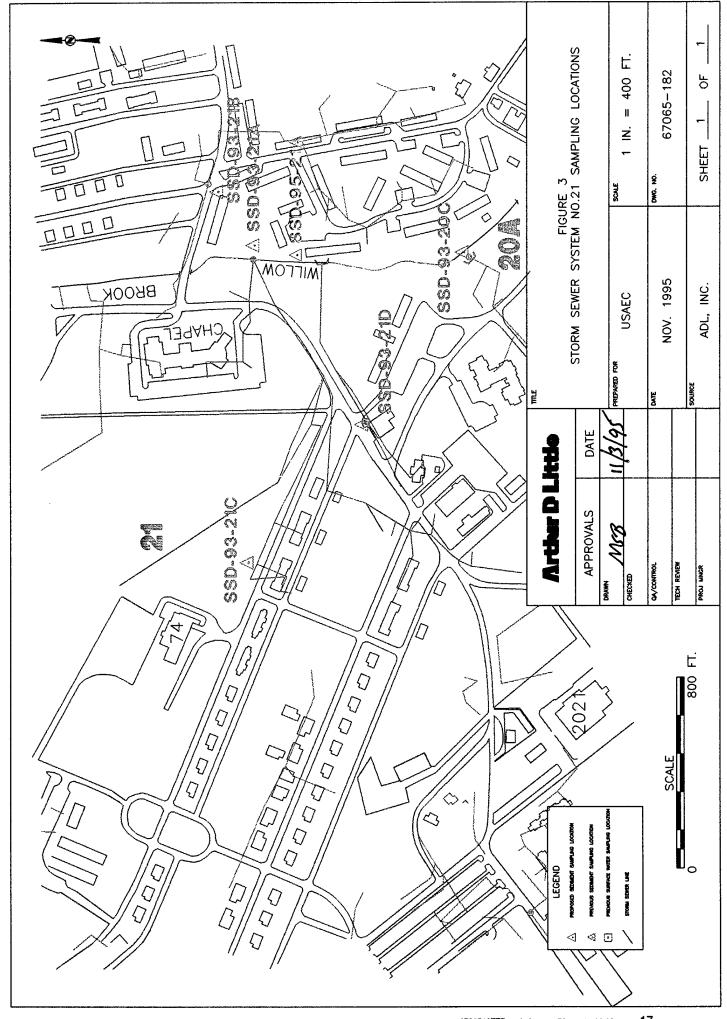
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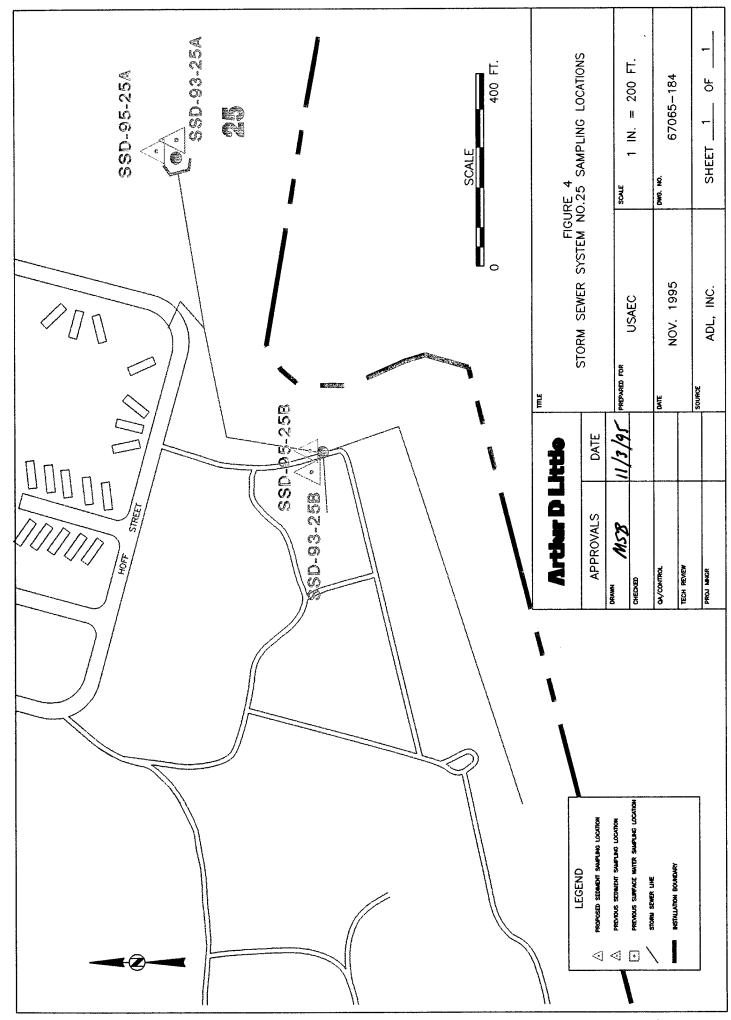
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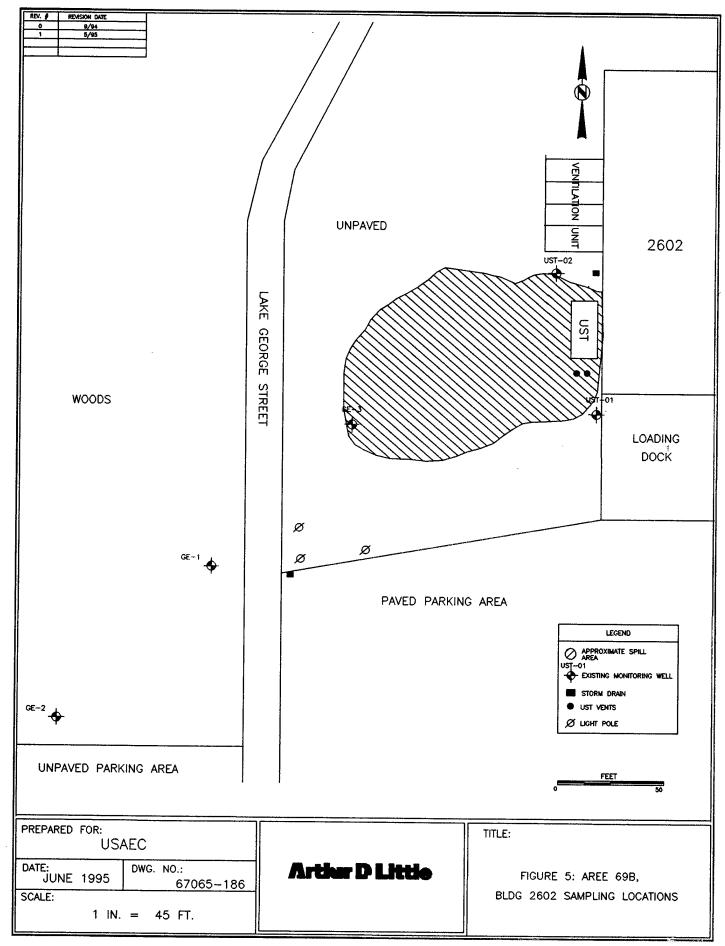


Table 1: Summary of Sampling Activities

Field Sample IDSite DescDX090400Storm Sev	• Desc rm Sev	escription Sewer 9 C	Sample Location Catch Basin 9D	Media Sediment	Analytes SVOCs, PCBs/Pesticides
DX090800 Storm Sewer 9	Sewer 9		10-20 ft from outlet of ponded area downstream of B&M right-of-way	Sediment	SVOCs, TOC, TPHC, Inorganics, PCBs/Pesticides
WX0908X1 Storm Sewer 9 16	Sewer 9		10-20 ft from outlet of ponded area downstream of B&M right-of-way	Surface Water	SVOCs, TOC, TPHC, Inorganics, Dissolved Metals, PCBs/Pesticides, TSS, Cl-, Sulfate, Alkalinity, Hardness
DX090900 Storm Sewer 9 W	Sewer 9		Within low-lying wetland, west of B&M right-of-way	Sediment	SVOCs, TOC, TPHC, Inorganics, PCBs/Pesticides
WX0909X1 Storm Sewer 9	Sewer 9	'^ K 'F	Within low-lying wetland, west of B&M right-of-way	Surface Water	SVOCs, TOC, TPHC, Inorganics, Dissolved Metals, PCBs/Pesticides, TSS, Cl-, Sulfate, Alkalinity, Hardness
DX091000 Storm Sewer 9 C	Sewer 9		Channel west of Patton Road	Sediment	SVOCs, TOC, TPHC, Inorganics, PCBs/Pesticides
WX0910X1 Storm Sewer 9 C	Sewer 9		Channel west of Patton Road	Surface Water	SVOCs, TOC, TPHC, Inorganics, Dissolved Metals, PCBs/Pesticides, TSS, Cl-, Sulfate, Alkalinity, Hardness
DX091100 Storm Sewer 9 I	Sewer 9		In drainage swale upstream of culvert under Dakota Street	Sediment	SVOCs, TOC, TPHC, Inorganics, PCBs/Pesticides

Site ID	Fleid Sample ID	Site Description	Sample Location	Media	Analytes
SSW-95-09K	WX0911X1	Storm Sewer 9	In drainage swale upstream of culvert under Dakota Street	Surface Water	SVOCs, TOC, TPHC, Inorganics, Dissolved Metals, PCBs/Pesticides, TSS, Cl-, Sulfate, Alkalinity, Hardness
SSD-95-09L	DX091200	Storm Sewer 9	At piped outlet of Storm Drain Number 9	Sediment	SVOCs, TOCs, TPHC, Inorganics, PCBs/Pesticides
760-56-MSS	WX0912X1	Storm Sewer 9	At piped outlet of Storm Drain Number 9	Surface Water	SVOCs, TOC, TPHC, Inorganics, Dissolved Metals, PCBs/Pesticides, TSS, Cl-, Sulfate, Alkalinity, Hardness
SSD-95-14A SSD-95-14C	DX140100 DX140300	Storm Sewer 14	Outfalls 14A and 14C	Sediment	Filtered and Unfiltered Metals, PCBs/Pesticides
SSD-95-21A	DX210100	Storm Sewer 21	Outfall 21A	Sediment	SVOCs
SSD-95-25A SSD-95-25B	DX250100	Storm Sewer 25	Outfall 25A, Internal Sample at 25B	Sediment	Filtered and Unfiltered Metals, SVOCs
UST-01	*10TUXD	AREE 69B	Monitoring Well UST-01	Ground Water	ТРНС
UST-02	GXUT02*	AREE 69B	Monitoring Well UST-02	Ground Water	TPHC
GE-01	GXGE01_*	AREE 69B	Monitoring Well GE-01	Ground Water	ТРНС
GE-02	GXGE02_*	AREE 69B	Monitoring Well GE-02	Ground Water	TPHC
GE-03	GXGE03_*	AREE 69B	Monitoring Well GE-03	Ground Water	TPHC

<sup>\*</sup> The blanks are reserved for the depth at which the sample will be collected. The blanks will be filled in on the day of the sampling event.

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Table 2: Comparison of 1993 and 1995 Data

Site ID Sample Date	SSD-95-09D 7/9/95	SSD-93-09D 8/19/93	SSD-95-14A 7/10/95	SSD-93-14A 8/19/93	SSD-95-14C 7/10/95	SSD-93-14C 8/19/93
Semivolatile Organics	so					
Polynuclear Aromatics	cs					
Pyrene	3.0	13.0			1	
Pesticides						
DDD	.0027 (LT)	.043	.035 (ND)	0.27	.0027 (LT)	.026
DDE	.0027 (LT)	.005	.027 (ND)	0.055	.0027 (LT)	800.
DDT	.0035 (LT)	.022	.105 (est.)	0.68	.0035 (LT)	.10
Metals						
Arsenic	-		15	9.51	7.97	3.4
Barium	:	;	67.5	71.4	24.9	45.8
Lead	1		140	52	10.1	45
Vanadium	1	1	40.5	44.2	14.2	30.6

Note: All results are recorded in µg/g

ND = Not detected LT = Less than GT = Greater than est. = Estimate

Table 2: Comparison of 1993 and 1995 Data (continued)

Site ID Sample Date	SSD-95-21A 7/10/95	SSD-83-21A 8/23/95	SSD-95-25A 7/10/95	SSD-93-25A 8/24/93	SSD-95-25B 7/10/95	SSD-93-25B 8/24/93
Semivolatile Organics	S		-			
Polynuclear Aromatics	S					
Acenaphthylene	-	-	9.0	3.6	9.0	0.37
Anthracene	1.0 (LT)	11	-	-		1
Benzo(a)anthracene	0.5	15	09	12	40	2.2
Benzo(a)pyrene	2.0 (LT)	11	30	12	10	t T
Chrysene	0.5	13	20	16	40	2.4
Fluoranthene	0.5	6.2	2	6.2 (GT)	90	2.6
Phenanthrene	0.4	12	100	26	30	3.2
Pyrene	9.0	6.2		-		
Metals						
Selenium	1	1	0.449 (LT)	1.07	0.449	4 4

Note: All results are recorded in µg/g

ND = Not detected LT = Less than GT = Greater than est. = Estimate

Table 3: Ground Water Monitoring Well Samples, AREE 69B

Sample Location	1995 TPHC μg/L	1994 TPHC μg/L
UST - 01	397	7,200
UST - 02	110	9,600
GE - 01	100	2,300
GE - 02	1,130	290
GE - 03	100	100

Appendix A: Data Summary Tables - Supplemental Sampling Event

Fon Deens Appendix Table

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Unit Meas	NGF	NGL	NGL	ner	NGL	ner	NGL		UGL	990 990 990 990 990 990 990 990 990 990
Meas Value Bool	100.000 LT	1,130.000	100.000 LT	774.000 LT	232,000.000	139,000.000	100.000 LT	8,870,000 60,000 LT 39,500 2,410 22,300,000 22,300,000 24,700,000 24,700,000 32,100 LT 2,380,000 10,000 LT 1,380,000 10,5000 LT 2,380,000 10,5000 LT 2,5000 LT 27,600 LT 27,600 LT 27,600 LT	18,000,000 53,000,000	0.001 0.005 0.005 0.000
Compound Name	Total Petroleum Hydrocarbons	Total Petroleum Hydrocarbons	Total Petroleum Hydrocarbons	Total Suspended Solids	Total Hardness	Alkalinity	Total Petroleum Hydrocarbons	Aluminum Antimony Barium Barylium Cadmium Calcium Chromium Cobalt Cobper Iron Magnesium Manganese Nickel Poassium Silver Sodium Thallium Vanadium	Chloride Sulfate	Aldrin Chlordane Dieldrin Endosulfan I Endosulfan II Endosulfan II Endosulfan II Endosulfan II Endosulfan II Endosulfan II Indane Mehachlor epoxide Isodrin Lindane Methoxychlor PCB 1016 PCB 1221
Method	4181	4181	4181	1602	2340	3102	4181	SS	1709 1709	
Depth	0:0	0:0	0:0	0.0	0.0	0.0	0.0	000000000000000000000000000000000000000	0.0	000000000000000000000000000000000000000
QC Test										
Data Quals								X		
Flag Code			Q			Ħ				n 8 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
Lot	ATRB	ATRB	ATRB	ATVF	ATRZ	ATOG	ATRB	AHRY AHRY AHRY AHRY AHRY AHRY AHRY AHRY	ATOB ATOB	ATMG ATMG ATMG ATMG ATMG ATMG ATMG ATMG
Sample Date	07/10/95	WELL 07/10/95	07/10/95	07/10/95	07/10/95	07/10/95	07/10/95	07/10/95 07/10/95 07/10/95 07/10/95 07/10/95 07/10/95 07/10/95 07/10/95 07/10/95 07/10/95 07/10/95	07/10/95 07/10/95	07/10/95 07/10/95 07/10/95 07/10/95 07/10/95 07/10/95 07/10/95 07/10/95 07/10/95
Site Type	WELL	WELL	WELL	WELL	WELL	WELL	WELL	WELL WELL WELL WELL WELL WELL WELL WELL	WELL	STSW STSW STSW STSW STSW STSW STSW STSW
Media Type	CGW	CGW	CGW	CGW	CGW	CGW	CGW		M90 M90	SSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSS
Field Sample No.	GXGE0100	GXGE0200	GDGE0300	GXGE0300	GXGE0300	GXGE0300	GXGE0300	GXGE0300 GXGE0300 GXGE0300 GXGE0300 GXGE0300 GXGE0300 GXGE0300 GXGE0300 GXGE0300 GXGE0300 GXGE0300 GXGE0300 GXGE0300 GXGE0300 GXGE0300 GXGE0300 GXGE0300 GXGE0300	GXGE0300 GXGE0300	DX090400
Site ID	GE-01	GE-02	GE-03	GE-03	GE-03	GE-03	GE-03	68 68 68 68 68 68 68 68 68 68 68 68 68 6	GE-03 GE-03	SSD-95-09D SSD-95-09D SSD-95-09D SSD-95-09D SSD-95-09D SSD-95-09D SSD-95-09D SSD-95-09D SSD-95-09D SSD-95-09D SSD-95-09D SSD-95-09D SSD-95-09D SSD-95-09D SSD-95-09D

10/26/95

Unit Meas	990 990 990 990 990 990 990 990 990 990	990 990 990 990 990 990 990 990 990 990
Meas Bool	0.100 ND 0.047 ND 0.047 LT 0.025 LT 0.007 LT 0.008 LT 0.002 LT 0.002 LT 0.002 LT	0.000 LT
Value		
Compound Name	PCB 1242 PCB 1248 PCB 1254 PCB 1260 Toxaphene alpha-BHC dela-BHC p.p'-DDD p.p'-DDE p.p'-DDT	1.2.4-Trichlorobenzene 1,2-Dichlorobenzene 1,4-Dichlorobenzene 2,4,5-Trichlorophenol 2,4-Dinitrophenol 2-Methyl-4-6-dinitrophenol 2-Methyl-4-6-dinitrophenol 2-Methyl-4-6-dinitrophenol 3-Methyl-4-6-dinitrophenol 3-Methyl-4-Chlorophenol 3-Methyl-4-Chlorophenol 3-Nitrophenol 3-Nitrophenol 3-Nitrophenol 4-Nitrophenol 3-Methyl-4-Chlorophenol 3-Methyl-4-Chlorophenol 3-Methyl-4-Chlorophenol 4-Nitrophenol 4-Nitrophenol 4-Nitrophenol Barzofalphene Benzofalpytene Benzofalpytene Benzofalpytene Benzofalpytene Benzofalpytene Benzofalpytene Benzofalpytene Benzofalphthatace Benzofalphthatace Benzofalphthatace Benzofalphthatace Bis(2-chylhexyl) phthalate Bis(2-chylhexyl) phthalate Di-n-buryl phthalate Di-n-buryl phthalate Di-n-ocytyl phthalate
Method	LH17 LH17 LH17 LH17 LH17 LH17 LH17 LH17	IM25
Depth		000000000000000000000000000000000000000
QC Test Code		
Data Quals		
Flag Code	444	~
Lot	ATMG ATMG ATMG ATMG ATMG ATMG ATMG ATMG	ATMU ATMU ATMU ATMU ATMU ATMU ATMU ATMU
Sample Date	07/10/95 07/10/95 07/10/95 07/10/95 07/10/95 07/10/95 07/10/95	97/10/95 97/10/95
Site Type	STSW STSW STSW STSW STSW STSW STSW STSW	STSW STSW
Media Type		<b>888 88 888 888 888 888 888 888 888 888 888 888 </b>
Field Sample No.	DX090400 DX090400 DX090400 DX090400 DX090400 DX090400 DX090400 DX090400 DX090400 DX090400	DX090400
Site ID	SSD-95-09D SSD-95-09D SSD-95-09D SSD-95-09D SSD-95-09D SSD-95-09D SSD-95-09D SSD-95-09D SSD-95-09D SSD-95-09D SSD-95-09D	\$\$25.54.90\$ \$\$25.5

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Unit Meas	990 990 990 990 990 990 990 990 990	ngg	ngg	DDN	990 990 990 990 990 990 990 990 990 990	990 990 990 990 990 990 990 990 990 990
Meas Bool	1.000 LT 5.000 5.000 0.800 LT 0.800 LT 0.600 LT 4.000 LT 0.700 1.000 LT 0.100 LT 3.000 LT	17.700	0.449 LT	140.000	9,990,000 19,600 LT 59,100 19,500 3,910,000 9,990 50,000 20,700,000 3,790,000 44,400 1,690,000 1,690,000 34,300 LT 631,000 34,300 LT 41,700	0.003 0.003 0.007 0.000 0.000 0.000 0.000 0.000 0.000 0.100 0.000
Value				1	9,9 3,7,7 3,7,7 6,6	
Compound Name	Hexachlorocyclopentadiene Hexachlorocehane Hexadecanoic acid / Palmitic Indeno[1,2,3-C,D]pyrene Isophorone N-Nitrosodi-n-propylamine N-Nitrosodiphenylamine N-Nitrosodiphenylamine N-Nitrosodiphenylamine N-Phythalene Nerobenzene Octadecanoic acid / Stearic Pentachlorophenol Phenanthrene Phenol	Arsenic	Selenium	Lead	Aluminum Antimony Barium Beryilium Cadmium Calcium Chromium Copper Copper Iron Maganesium Manganese Nickel Silver Sodium Thalium Vanadium	Aldrin Chlordane Dieldrin Endosulfan I Endosulfan II Endrin Endrin aldehyde Heptachlor Heptachlor epoxide Isodrin Lindane Methoxychlor PCB 1016 PCB 1221 PCB 1232
Method	LM25 LM25 LM25 LM25 LM25 LM25 LM25 LM25	B9	JD20	JD21	1812 1812 1812 1812 1812 1812 1812 1812	LH17 CH17 CH17 CH17 CH17 CH17 CH17 CH17 C
Depth	000000000000000000000000000000000000000	0.0	0.0	0.0	000000000000000000000000000000000000000	000000000000000000000000000000000000000
QC Test s Code						
Data Quale					Z H	
Flag	88 88	Q	Q	DB		99900000000999
Lot	ATIM ATIMI ATIMI ATIMI ATIMI ATIMI ATIMI ATIMI ATIMI ATIMI ATIMI	ATSX	ATSZ	ATSY	ATRX ATRX ATRX ATRX ATRX ATRX ATRX ATRX	ATMG ATMG ATMG ATMG ATMG ATMG ATMG ATMG
Sample Date	07/10/95 07/10/95 07/10/95 07/10/95 07/10/95 07/10/95 07/10/95 07/10/95 07/10/95	07/10/95	07/10/95	07/10/95	07/10/95 07/10/95 07/10/95 07/10/95 07/10/95 07/10/95 07/10/95 07/10/95 07/10/95 07/10/95 07/10/95 07/10/95	07/10/95 07/10/95 07/10/95 07/10/95 07/10/95 07/10/95 07/10/95 07/10/95 07/10/95 07/10/95
Site Type	STSW STSW STSW STSW STSW STSW STSW STSW	STSW	<b>STSW</b>	WSLS	STSW STSW STSW STSW STSW STSW STSW STSW	STSW STSW STSW STSW STSW STSW STSW STSW
Media Type	SS	CSE	CSE	CSE		SS
Ffeld Sample No.	DX090400 DX090400 DX090400 DX090400 DX090400 DX090400 DX090400 DX090400 DX090400 DX090400 DX090400 DX090400 DX090400 DX090400	DD140100	DD140100	DD140100	DD146100 DD146100 DD146100 DD146100 DD146100 DD146100 DD146100 DD146100 DD146100 DD146100 DD146100 DD146100 DD146100 DD146100 DD146100 DD146100	DD140100 DD140100 DD140100 DD140100 DD140100 DD140100 DD140100 DD140100 DD140100 DD140100 DD140100 DD140100 DD140100 DD140100
Site ID	SSD-95-09D SSD-95-09D	SSD-95-14A	SSD-95-14A	SSD-95-14A	SSD-95-14A SSD-95-14A	SSD-95-14A SSD-95-14A

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	1						
Unit Meas	99n 99n 99n 99n 99n 99n 99n 99n	ngg	990	DDN	ngg	99n 99n 99n 99n 99n 99n 99n 99n 99n 99n	950 050 050 050 050 050 050 050 050 050
Meas e Bool	0.100 ND 1.160 0.047 LT 0.002 LT 0.007 LT 0.008 LT 0.035 0.026	0.270	15.000	0.449 LT	140.000	9,860,000 19,600 LT 67,500 0,427 LT 13,200 50,700 8,880 44,100 19,900,000 287,000 48,500 1,600,000 1,600,000 1,600,000 3,4300 LT 40,500 328,000	0.013 0.068 LT 0.007 0.006 0.001 0.000 LT 0.001 LT 0.001 LT 0.001 LT 0.001 LT 0.100 ND 0.100 ND 0.100 ND 0.100 ND
Value						1	
Compound Name	PCB 1248 PCB 1254 PCB 1260 Toxaphene alpha-BHC beta-BHC delta-BHC p.pDDD	Mercury	Arsenic	Selenium	Lead	Aluminum Antimony Barium Berylium Calcium Calcium Chromium Cobelt Copper Iron Manganese Nickel Potassium Silver Sodium Thallium Vanadium	Aldrin Chlordane Dieldrin Endosulfan I Endosulfan II Endrin Endrin aldehyde Heptachlor epoxide Isodrin Lindane Methoxychlor PCB 1221 PCB 1221 PCB 1222 PCB 1248 PCB 1248
Method	LH17 LH17 LH17 LH17 LH17 LH17 LH17 LH17	<b>k</b>	B9	1020	JD21	NS12 NS12 NS12 NS12 NS12 NS12 NS12 NS12	[H17]
Depth	000000000000000000000000000000000000000	0.0	0:0	0.0	0.0	000000000000000000000000000000000000000	000000000000000000000000000000000000000
QC Test Code							·
Data Quais						z	
Flag Code	200 200 200 200 200 200 200 200 200	Ω		1	m		ZT111 C21 ZZ
Lot	ATMG ATMG ATMG ATMG ATMG ATMG ATMG ATMG	ATQB	ATSX	ATSZ	ATSY	ATRX ATRX ATRX ATRX ATRX ATRX ATRX ATRX	ATMG ATMG ATMG ATMG ATMG ATMG ATMG ATMG
Sample Date	97/10/95 97/10/95 97/10/95 97/10/95 97/10/95 97/10/95 97/10/95	07/10/95	07/10/95	07/10/95	07/10/95	07/10/95 07/10/95 07/10/95 07/10/95 07/10/95 07/10/95 07/10/95 07/10/95 07/10/95 07/10/95 07/10/95 07/10/95	07/10/95 07/10/95 07/10/95 07/10/95 07/10/95 07/10/95 07/10/95 07/10/95 07/10/95 07/10/95 07/10/95 07/10/95
Site Type	STSW STSW STSW STSW STSW STSW STSW STSW	STSW	STSW	STSW	STSW	STSW STSW STSW STSW STSW STSW STSW STSW	STSW STSW STSW STSW STSW STSW STSW STSW
Media Type	SS	CSE	CSE	CSE	CSE	SS	SE S
Field Sample No.	DD140100 DD140100 DD140100 DD140100 DD140100 DD140100 DD140100 DD140100	DD140100	DX140100	DX140100	DX140100	DX140100 DX140100 DX140100 DX140100 DX140100 DX140100 DX140100 DX140100 DX140100 DX140100 DX140100 DX140100 DX140100 DX140100 DX140100 DX140100 DX140100 DX140100 DX140100	DX140100 DX140100 DX140100 DX140100 DX140100 DX140100 DX140100 DX140100 DX140100 DX140100 DX140100 DX140100 DX140100 DX140100 DX140100 DX140100 DX140100 DX140100
Site ID	SSD-95-14A SSD-95-14A SSD-95-14A SSD-95-14A SSD-95-14A SSD-95-14A SSD-95-14A SSD-95-14A SSD-95-14A SSD-95-14A	SSD-95-14A	SSD-95-14A	SSD-95-14A	SSD-95-14A	SSD-95-14A SSD-95-14A	SSD-95-14A SSD-95-14A

Meas Unit Value Bool Meas	0.226 LT UGG 0.002 LT UGG 0.007 LT UGG 0.008 LT UGG 0.035 UGG 0.027 UGG 0.027 UGG	0.281 UGG	7.970 UGG	0.449 LT UGG	10.100 UGG	7,060,000 UGG 19,600 LT UGG 24,900 UGG 1,200 LT UGG 997,000 UGG 21,100 UGG 4,840 UGG 4,120,000 UGG 14,20,000 UGG 1,400 UGG 1,400 UGG 1,400 UGG 31,400 UGG 31,400 UGG 1,400 UGG 31,400 UGG 31,400 UGG 31,400 UGG	0.001 LT UGG 0.008 LT UGG 0.001 LT UGG 0.001 LT UGG 0.000 LT UGG 0.000 LT UGG 0.000 LT UGG 0.001 LT UGG 0.001 LT UGG 0.001 LT UGG 0.100 ND UGG
Compound Name	Toxaphene alpha-BHC beta-BHC delta-BHC p.pDDD p.pDDE p.pDDT	Mercury	Arsenic	Selenium	Lead	Aluminum Antimony Barium Cadmium Cadmium Calcium Chromium Cobalt Copper Iron Magnesium Manganese Nickel Potassium Silver Sodium Thalium Vanadium	Aldrin Chlordane Dieldrin Endosulfan I Endosulfan II Endrin aldehyde Heptachlor epoxide Isodrin Lindane Methoxychlor PCB 1221 PCB 1221 PCB 1232 PCB 1248 PCB 1248 PCB 1248 PCB 1254 PCB 1256 PCB 1260 Toxaphene
Method		. A	B9	JD20	JD21	JS12 JS12 JS12 JS12 JS12 JS12 JS12 JS12	LH17 LH17 LH17 LH17 LH17 LH17 LH17 LH17
Depth	0000000	0.0	0.0	0.0	0.0		200200000000000000000000000000000000000
QC Test s Code							
Data Quals						Z H	
Flag Code	ខ្មា				В		H HHHH
Lot	ATMG ATMG ATMG ATMG ATMG ATMG	ATQB	ATSX	ATSZ	ATSY	ATRX ATRX ATRX ATRX ATRX ATRX ATRX ATRX	ATMG ATMG ATMG ATMG ATMG ATMG ATMG ATMG
Sample Date	07/10/95 07/10/95 07/10/95 07/10/95 07/10/95	07/10/95	07/10/95	07/10/95	07/10/95	07/10/95 07/10/95 07/10/95 07/10/95 07/10/95 07/10/95 07/10/95 07/10/95 07/10/95 07/10/95 07/10/95 07/10/95	07/10/95 07/10/95 07/10/95 07/10/95 07/10/95 07/10/95 07/10/95 07/10/95 07/10/95 07/10/95 07/10/95 07/10/95 07/10/95
Site Type	STSW STSW STSW STSW STSW STSW STSW	STSW	STSW	STSW	STSW	STSW STSW STSW STSW STSW STSW STSW STSW	STSW STSW STSW STSW STSW STSW STSW STSW
Media Type	22222222222222222222222222222222222222	CSE	CSE	CSE	CSE	SSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSS	CSE
Field Sample No.	DX140100 DX140100 DX140100 DX140100 DX140100 DX140100 DX140100	DX140100	DX140300	DX140300	DX140300	DX140300	DX140300 DX140300
Site ID	SSD-95-14A SSD-95-14A SSD-95-14A SSD-95-14A SSD-95-14A SSD-95-14A SSD-95-14A	SSD-95-14A	SSD-95-14C	SSD-95-14C	SSD-95-14C	SSD-95-14C SSD-95-14C	SSD-95-14C SSD-95-14C

Unit Meas	990 090 090 090 090	nee	950 950 950 950 950 950 950 950 950 950
Meas Bool	0.007 LT 0.008 LT 0.002 LT 0.002 LT 0.003 LT	0.050 LT	0.400 LT 0.080 LT 0.080 LT 0.080 LT 0.080 LT 0.000 LT 0.100 LT 0.1
Value			
Compound Name	beta-BHC delta-BHC p.pDDD p.p-DDE p.p-DDT	Mercury	1,2,4-Trichlorobenzene 1,2-Dichlorobenzene 1,3-Dichlorobenzene 1,4-Dichlorobenzene 2,4,5-Trichlorophenol 2,4-G-Trichlorophenol 2,4-Dinitrophenol 2,4-Dinitrophenol 2,4-Dinitrophenol 2,4-Dinitrophenol 2,4-Dinitrophenol 2,4-Dinitrophenol 2,4-Dinitrophenol 2-Methylphenol 2-Methylphenol 2-Methylphenol 3-Nitroaniline 2-Nitroaniline 3-Methylphenol 3-Nitroaniline 4-Bromophenylphenyl Ether 4-Chlorophenylphenyl Ether 4-Chlorophenylphenyl Ether 4-Rethylphenol 3-Nitroaniline 3-Methylphenol 3-Nitroaniline 4-Bromophenylphenyl Ether 4-Chlorophenylphenyl Ether 4-Chlorophenylphenyl Ether 4-Chlorophenylphenol 3-Nitroaniline 3-Methylphenol 3-Nitroaniline 4-Bromophenylphenyl Ether 4-Chlorophenylphenyl Ether 4-Chlorophenylphenyl Ether 4-Chlorophenylphenol 3,3-Dichlorophenol 4-Nitrophenol 4-Nitrophenol 4-Nitrophenol 4-Nitrophenol 5-Graphylphenol 6-Chlorophenol 7-Chlorophenol 8-Chlorophenol 8-Chloroph
Method	LH17 LH17 LH17 LH17 LH17	¥9	LM25 LM25 LM25 LM25 LM25 LM25 LM25 LM25
Depth	0.0000	0.0	
QC Test Code			
Data Quals			
Flag Code			<b>∠</b>
Lot	ATMG ATMG ATMG ATMG ATMG	ATQB	ATIMU
Sample Date	07/10/95 07/10/95 07/10/95 07/10/95	07/10/95	07/10/95 07/10/95
Site Type	STSW STSW STSW STSW STSW	STSW	STSW STSW STSW STSW STSW STSW STSW STSW
Media Type	CSE CSE CSE CSE	CSE	888 888 888 888 888 888 888 888 888 88
Field Sample No.	DX140300 DX140300 DX140300 DX140300 DX140300	DX140300	DX2101X1
Site ID	SSD-95-14C SSD-95-14C SSD-95-14C SSD-95-14C SSD-95-14C	SSD-95-14C	SSD-95-21A

Fort Decens Appendix Table

Unit Meas	990 990 990 990 990 990 990 990 990 990	990 990 990 990 990 990 990 990 990 990
Meas Bool	2,000 5,000 1,1 0,800 1,1 0,600 1,1 0,600 1,1 0,600 1,1 0,600 0,400 0,600 0 0 0	22000 LT
Value	4000000	400000006855408018554686444468
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<u>ə</u>	id / Palmitic Alpyrene opylamine ylamine d / Stearic	nnzene  zene  zene  zene  tenol  nol  1  1  zidine  rophenol  henyl Ether  henyl Ether  hene  ne  ne  ne  ne  ne  ne  ne  ne
Compound Name	Hexadecanoic acid / Palmitic Indeno[1,2,3-C,D]pyrene Isophorone N-Nitrosodi-n-propylamine N-Nitrosodiphenylamine N-Nitrosodiphenylamine Nitrobenzene Octadecanoic acid / Stearic Pentachlorophenol Phenanthrene Phenol	12,4-Trichlorobenzene 1,2-Dichlorobenzene 1,4-Dichlorobenzene 2,4-Trichlorophenol 2,4-Dichlorophenol 2,4-Dichlorophenol 2,4-Dinitrophenol 3,1-Dichlorobenzidine 2-Methylphenol 3,4-Dinitrophenol 3,4-Dinitrophenol 3,4-Dinitrophenol 3,1-Dichlorobenzidine 3-Methylphenol 4-Mitrophenol 4-Mitrophenol Acenaphthylene Benzola]anthracene Benzola]anthracene Benzola]anthracene Bis(2-chylberzyl phthalate Chrysene Dienzyl phthalate Dienzyl phthalate Dienzyl phthalate Dienzyl phthalate Dienzyl phthalate
Com	Hexade Indenol Isophor N-Nitro N-Nitro Naphth Nitrobe Octade Pentach Phenal Phenal	2,2,1,1,2,2,2,2,2,2,2,2,2,2,2,2,2,2,2,2
Method	LM25 LM25 LM25 LM25 LM25 LM25 LM25 LM25	M25   M25
Depth	000000000000	
QC Test Code		
Data Quals		
Flag Code	8 8	
Lot	ATM ATM ATM ATM ATM ATM ATM ATM ATM ATM	ATIMU
Sample Date	07/10/95 07/10/95 07/10/95 07/10/95 07/10/95 07/10/95 07/10/95 07/10/95	971095 971095 971095 971095 971095 971095 971095 971095 971095 971095 971095 971095 971095 971095 971095 971095 971095 971095 971095 971095
Site Type	STSW STSW STSW STSW STSW STSW STSW STSW	STSW STSW STSW STSW STSW STSW STSW STSW
Media Type	SS	88888888888888888888888888888888888888
Field Sample No.	DX2101X1	DD250100
Site ID	SSD-95-21A SSD-95-21A SSD-95-21A SSD-95-21A SSD-95-21A SSD-95-21A SSD-95-21A SSD-95-21A SSD-95-21A SSD-95-21A SSD-95-21A SSD-95-21A SSD-95-21A	SSD-95-25A SSD-95-25A

10/26/95

Unit Meas	990 990 990 990 990 990 990 990 990 990	UGL	NGL	NGL	NGL	
Meas Bool	0.600 LT 0.800 LT 5.000 LT 20.000 LT 20.000 LT 20.000 LT 7.000 LT 7.000 LT 20.000 LT 7.000 LT 7.000 LT 7.000 LT	2.350 LT	0.100 LT	4.470 LT	2.530 LT	112.000 LT 2.820 LT 1.120 LT 1
Value	11 22 17 77 77					
Compound Name	Fluorene Hexachlorobenzene Hexachlorobutadiene Hexachlorocyclopentadiene Hexachlorocthane Indeno[1,2,3-C,D]pyrene Isophorone N-Nitrosodi-n-propylamine N-Nitrosodiphenylamine N-Nitrobenzene Pentachlorophenol Phenanthrene Phenol	Arsenic	Mercury	Lead	Selenium	Aluminum Antimony Barium Berylium Cadmium Cadmium Calcium Chromium Cobalt Copper Iron Magnesium Magnesium Manganese Nickel Potassium Silver Sodium Thallium Vanadium Zinc Aldrin Dieldrin Endosulfan I
Method	LM25 LM25 LM25 LM25 LM25 LM25 LM25 LM25	AX8	CC3	SD18	SD25	SS12 SS12 SS12 SS12 SS12 SS12 SS12 SS12
Depth	000000000000000000000000000000000000000	0.0	0.0	0.0	0.0	
QC Test Code		×	œ	~	æ	队队队队队队队队队队队队队队队队队 队队队队队队队员员员员员员
Data Quals						
Flag Lot Code	ATM D	ATSA	АТОН	ATSB	ATŞC	ATRY ATRY ATRY ATRY ATRY ATRY ATRY ATRY
Site Sample Type Date	STSW 07/10/95	RNSW 07/10/95	RNSW 07/10/95	RNSW 07/10/95	RNSW 07/10/95	RNSW 07/1095
Media Type	SE S	CSE	CSE	CSE	CSE	SECONO SE
Field Sample No.	DD250100	DR250100	DR250100	DR250100	DR250100	DR250100
Site 1D	SSD-95-25A SSD-95-25A SSD-95-25A SSD-95-25A SSD-95-25A SSD-95-25A SSD-95-25A SSD-95-25A SSD-95-25A SSD-95-25A SSD-95-25A SSD-95-25A SSD-95-25A SSD-95-25A SSD-95-25A SSD-95-25A SSD-95-25A	SSD-95-25A	SSD-95-25A	SSD-95-25A	SSD-95-25A	SSD-95-25A SSD-95-25A

For Dennis Appendix Table

Unit Meas		
Meas Value Bool	0.385 ND 0.385 ND 0.176 ND 0.176 LT 1.640 LT 0.002 LT 0.003 LT 0.003 LT 0.003 LT 0.003 LT	2.400 LT 1.200 LT 1.200 LT 1.500 LT 1.500 LT 1.500 LT 1.700 LT 1.700 LT 1.700 LT 2.800 LT 8.800 LT 8.800 LT 8.200 LT 1.300 LT 1.300 LT 1.300 LT 2.800 LT 2.800 LT 2.800 LT 2.800 LT 1.300 LT 1.3
Compound Name	PCB 1242 PCB 1248 PCB 1254 PCB 1256 PCB 1260 Toxaphene alpha-Chlordane bca-BHC delta-BHC pp-DDD pp-DDE	1.2.3-Trichlorobenzene 1.2.Dichlorobenzene 1.2.Dichlorobenzene 1.2.Dichlorobenzene 1.3-Dichlorobenzene 1.3-Dichlorobenzene 1.3-Dichlorobenzene 1.4-Dichlorobenzene 1.4-Dichlorophenol 2.4.5-Trichlorophenol 2.4.5-Trichlorophenol 2.4.Dimitrophenol 3.4.Dimitrophenol 2.5.Dimitrophenol 3.5.Dimitrophenol 3.5.Dimitrophenol 3.5.Dimitroaniline 3.5.Dimitroaniline 3.5.Dimitroaniline 4.Chlorophenylmethyl Sulfide 4.Chlorophenylmethyl Sulfone 4.Dimitrophenol
Method Co	UH20 PC UH20 PC UH20 PC UH20 PC UH20 abp UH20 abp UH20 bet UH20 bet UH20 bet UH20 bet UH20 bet UH20 bet	UM25 UM25 UM25 UM25 UM25 UM25 UM25 UM25
Depth	000000000000	000000000000000000000000000000000000000
QC Test Is Code	<b>KKKKKKKKKK</b>	**************************************
Flag Data Code Quals		>>>>\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\
F. Lot C	ATMH T ATMH ATMH	ATML V AT
Site Sample Type Date	RNSW 07/10/95	RNSW 07/10/95
Media (Type	22222222222222222222222222222222222222	\$25.50.50.50.50.50.50.50.50.50.50.50.50.50
Field Sample No.	DR250100	DR250100
Site ID	SSD-95-25A SSD-95-25A SSD-95-25A SSD-95-25A SSD-95-25A SSD-95-25A SSD-95-25A SSD-95-25A SSD-95-25A SSD-95-25A SSD-95-25A SSD-95-25A SSD-95-25A	SSD-95-25A

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Unit				
Meas Bool				
	15.000 10.000 3.100 6.800 6.800 17.700 22.000 23.000 7.400 7.400	1.500 5.100 12.000 25.500 5.500 5.500 5.200 13.000 5.0	6.000 2.2000 2.2000 2.2000 2.2000 12.2000 8.3000 2.2000 7.200 2.000 2.00	9.100 9.100 9.100 9.100 9.100 9.100 9.100
Value				
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		<b>್ಷ</b>	9e x	
	cthane r ether alate	Di-n-octyl phthalate Dibenz(ah)anthracene Dibenzofuran Dibromochloropropane Discolopentadiene Discolopentadiene Discolopentadiene Discopropylmethyl Phosphonate Dimethyl phthalate Dimethyl phthalate Dimethyl methyl Phosphate Endosulfan I Endosulfan I Endosulfan sulfate Endosulfan alfate Endosulfan alfate Endosulfan alfate Endosulfan alfate	Endrin ketone Samphur / Famophos // Warbex Fluoranthene Fluoranthene Heptachlor Heptachlor epoxide Hexachlorobenzene Hexachlorobutadiene Hexachlorocyclopentadiene Hexachlorocthane Hexachlorocthane Gadrin Isophorone Isodrin Stophorone Malathion Methoxychlor Methoxychlor	mine ine
92	Benzolghilperylene Benzolklfluoranthene Benzoic acid Benzyl alcohol Bis(2-chloroethoxy) methane Bis(2-chloroethyl) ether Bis(2-chloroisopropyl) ether Bis(2-chloroisopropyl) ether Chlordane Chlordane Chlordane Chlordane Chrysene Chrysene Chrysene Di-n-buryl phthalate	Di-n-octyl phthalate Dibenz(ahlanthracene Dibenzofuran Dibromochloropropane Dicyclopentadiene Dicyclopentadiene Dicyclopentadiene Dichtyl phthalate Dinethyl phthalate Dimethyl phthalate Endosulfan I Endosulfan II	Endrin ketone Famphur / Famophos / / Wa Faurphur / Famophos / / Wa Fluoranthene Fluoranthene Fluoranthene Fluoranthene Fluoranthene Hexachlorobenzene Hexachlorochuadiene Hexachlorochuadiene Hexachlorochuadiene Ideano[1,2,3-C,D]pyrene Isodrin Isophorone Lindane Malathion Methoxychlor Methoxychlor	N. Nitrosodi-n-propylamine N. Nitrosodimethylamine N. Nitrosodimethylamine N. Nitrosodiphenylamine Nitrobenzene Nitrobenzene PCB 1221 PCB 1232 PCB 1242 PCB 1242 PCB 1242 PCB 1248 PCB 1254
d Nan	Iperyk huorani cid cohol rroetho rroetho rroisop rhexyl hexyl me / K	I phtha I nethyl n I n sulfa n sulfa sulfa behyde	/ Famcene / Famcene cree cree or cree	odi-n-p odimet odiphe ene 5 6 7 7 8 8 8 8
Compound Name	Benzo[ghi]perylene Benzoik [fluoranthene Benzoic acid Benzoic acid Benzyl alcohol Bis(2-chloroethyl) ethe Bis(2-chloroethyl) ethe Bis(2-chloroisopropyl) Bis(2-cthylhexyl) phth Bromacil Butylbenzyl phthalate Chlordane Chlordacone / Kepone Chrysene	Di-n-octyl phthalate Dibenz(ahlanthracene Dibenzofuran Dibenzofuran Dicyclopentadiene Dinnethyl phthalate Endosulfan II Endosulfan sulfate Endrin	Endrin ketone Famphur / Famophos Fluoranthene Fluoranthene Fluoranthene Heptachlor epoxide Hexachlorobenzene Hexachlorobutadiene Hexachlorocyclopent Hexachlorocyclopent Indene(1,2,3-C,D]pyy Isodrin Isophorone Lindane Malathion Methoxychlor	N.Nitrosodi-N.Nitrosodi-N.Nitrosodin N.Nitrosodim N.Nitrosodim Nitrobenzene PCB 1221 PCB 1222 PCB 1232 PCB 1248 PCB 1248 PCB 1254 PCB 1260
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Method	UM25 UM25 UM25 UM25 UM25 UM25 UM25 UM25	UNZS UNZS UNZS UNZS UNZS UNZS UNZS UNZS	UM25 UM25 UM25 UM25 UM25 UM25 UM25 UM25	UM25 UM25 UM25 UM25 UM25 UM25 UM25 UM25
Me			555555555555555555	5555555555555
Depth	000000000000000000000000000000000000000		000000000000000000000000000000000000000	000000000000000000000000000000000000000
QC Test Code		*****************	***************	**************************************
Data (Quals				
Flag Code	>> % >> > > > > > > > > > > > > > > > >	>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>	%	*
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Lot	\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	***********	<b>~~~~~~~~~~</b>	
Sample Date	07/10/95 07/10/95 07/10/95 07/10/95 07/10/95 07/10/95 07/10/95 07/10/95 07/10/95	97/10/95 97/10/95 97/10/95 97/10/95 97/10/95 97/10/95 97/10/95 97/10/95 97/10/95 97/10/95	97/10/95 97/10/95 97/10/95 97/10/95 97/10/95 97/10/95 97/10/95 97/10/95 97/10/95	07/10/95 07/10/95 07/10/95 07/10/95 07/10/95 07/10/95 07/10/95
Site Type	RNSW RNSW RNSW RNSW RNSW RNSW RNSW RNSW	RNSW RNSW RNSW RNSW RNSW RNSW RNSW RNSW	RNSW RNSW RNSW RNSW RNSW RNSW RNSW RNSW	RNSW RNSW RNSW RNSW RNSW RNSW RNSW RNSW
dia e				
Media Type		88888888888888888888888888888888888888		
Ķo.	   88888888888888	888888888888888888888888888888888888888	800000000000000000000000000000000000000	888888888888888888888888888888888888888
Field Sample No.	DR250100	DR250100	DR250100	DR250100
E &				
Q	SSD-95-25A SSD-95-25A SSD-95-25A SSD-95-25A SSD-95-25A SSD-95-25A SSD-95-25A SSD-95-25A SSD-95-25A SSD-95-25A SSD-95-25A SSD-95-25A SSD-95-25A SSD-95-25A SSD-95-25A SSD-95-25A SSD-95-25A SSD-95-25A	SSD-95-25A SSD-95-25A SSD-95-25A SSD-95-25A SSD-95-25A SSD-95-25A SSD-95-25A SSD-95-25A SSD-95-25A SSD-95-25A SSD-95-25A SSD-95-25A SSD-95-25A SSD-95-25A SSD-95-25A	SSD-95-25A SSD-95-25A SSD-95-25A SSD-95-25A SSD-95-25A SSD-95-25A SSD-95-25A SSD-95-25A SSD-95-25A SSD-95-25A SSD-95-25A SSD-95-25A SSD-95-25A SSD-95-25A SSD-95-25A SSD-95-25A SSD-95-25A SSD-95-25A SSD-95-25A SSD-95-25A	SSD-95-25A SSD-95-25A SSD-95-25A SSD-95-25A SSD-95-25A SSD-95-25A SSD-95-25A SSD-95-25A SSD-95-25A SSD-95-25A SSD-95-25A
Site ID	889 889 889 889 889 889 889 889 889 889	8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8		88888888888888888888888888888888888888

Meas Unit Value Bool Meas	37,000 LT UGL 9,100 LT UGL 9,900 LT UGL 17,000 LT UGL 17,000 LT UGL 17,000 LT UGL 8,500 LT UGL 5,300 LT UGL 17,000 LT UGL 17,000 LT UGL 17,000 LT UGL 18,000 LT UGL 18,000 LT UGL 18,000 LT UGL 18,000 LT UGL	10.700 UGG	0.449 LT UGG	130.000 UGG	6,870,000 UGG 19,600 LT UGG 14,800 UGG 1,370,000 LT UGG 1,370,000 UGG 21,800 UGG 4,250 UGG 14,300,000 UGG 2,960,000 UGG 12,960,000 UGG 12,960,000 UGG 12,960,000 UGG 89,000 UGG 13,400 UGG 68,000 UGG 68,000 UGG 17,000 UGG 94,300 LT UGG 58,100 UGG 58,100 UGG	2.000 LT UGG 0.400 LT UGG 0.400 LT UGG 0.500 LT UGG 0.600 LT UGG 0.600 LT UGG 30.000 LT UGG 10.000 LT UGG 10.000 LT UGG 10.000 LT UGG 10.000 LT UGG 2.000 LT UGG 0.500 LT UGG 1.000 LT UGG 0.500 LT UGG 0.500 LT UGG 0.500 LT UGG 0.500 LT UGG
Compound Name	Parathion Pentachlorophenol Phenanthrene Phenol Pyrene Supona Toxaphene Vapona alpha-BHC beta-BHC ppt-DDD p,p-DDE	Arsenic	Selenium	Lead	Aluminum Antimony Barium Barium Cadrium Calcium Cabalt Chromium Cobalt Copper Iron Magnesium Manganese Nickel Potassium Silver Sodium Thallium Vanadium	1,2,4-Trichlorobenzene 1,2-Dichlorobenzene 1,3-Dichlorobenzene 1,4-Dichlorophenol 2,4,5-Trichlorophenol 2,4-Dirintorophenol 3,4-Dirintorophenol 2,4-Dirintorophenol 3,4-Dirintorophenol 3,
Method	UM25 UM25 UM25 UM25 UM25 UM25 UM25 UM25	B9	JD20	JD21	NS12 NS12 NS12 NS12 NS12 NS12 NS12 NS12	LM25 LM25 LM25 LM25 LM25 LM25 LM25 LM25
Depth	000000000000000000000000000000000000000	0.0	0.0	0.0	000000000000000000000000000000000000000	000000000000000000000000000000000000000
QC Test Code	***********					
Data Quals					Z H	
Flag Code	× × × × × × × × × × × × × × × × × × ×			æ		<u>د</u> -
Lot	ATML ATML ATML ATML ATML ATML ATML ATML	ATSX	ATSZ	ATSY	AHKX AHRX AHRX AHRX AHRX AHRX AHRX AHRX AHR	ATM ATM ATM ATM ATM ATM ATM ATM ATM ATM
Sample Date	07/10/95 07/10/95 07/10/95 07/10/95 07/10/95 07/10/95 07/10/95 07/10/95 07/10/95	07/10/95	07/10/95	07/10/95	07/10/95 07/10/95 07/10/95 07/10/95 07/10/95 07/10/95 07/10/95 07/10/95 07/10/95 07/10/95 07/10/95	07/10/95 07/10/95 07/10/95 07/10/95 07/10/95 07/10/95 07/10/95 07/10/95 07/10/95 07/10/95 07/10/95
Site Type	RNSW RNSW RNSW RNSW RNSW RNSW RNSW RNSW	STSW	STSW	STSW	STSW STSW STSW STSW STSW STSW STSW STSW	STSW STSW STSW STSW STSW STSW STSW STSW
Media Type	888888888888888888888888888888888888888	CSE	CSE	CSE	SSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSS	SER
Field Sample No.	DR250100	DX250100	DX250100	DX250100	DX250100 DX250100	DX250100 DX250100 DX250100 DX250100 DX250100 DX250100 DX250100 DX250100 DX250100 DX250100 DX250100 DX250100 DX250100 DX250100 DX250100 DX250100 DX250100 DX250100 DX250100 DX250100
Site 1D	SSD-95-25A SSD-95-25A SSD-95-25A SSD-95-25A SSD-95-25A SSD-95-25A SSD-95-25A SSD-95-25A SSD-95-25A SSD-95-25A SSD-95-25A SSD-95-25A SSD-95-25A SSD-95-25A SSD-95-25A SSD-95-25A SSD-95-25A	SSD-95-25A	SSD-95-25A	SSD-95-25A	SSD-95-25A SSD-95-25A	SSD-95-25A SSD-95-25A

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Unit Meas	990 990 990 990 990 990 990 990 990 990	000 000 000 000	990	DDn	990 990 990 990 990	) )
Meas Value Bool	20.000 LT 30.000		10.600	0.449 LT	74,000 4,700,000 19,600 LT 31,600 0,427 LT 1,200 LT 1,460,000	•
Compound Name	3,3'-Dichlorobenzidine 3-Methyl-4-Chlorophenol 3-Nitroaniline 4-Bromophenylphenyl Ether 4-Methylphenol 4-Nitrophenol A-cnaphthylene Acnaphthylene Acnaphthylene Acnaphthylene Acnaphthylene Benzolalpurane Benzolalpuranhene Bist2-chloroethoxy) methane Bist2-chloroethoxy) methane Bist2-chloroethoxy) methane Bist2-chloroethoxy) phthalate Di-n-octyl phthalate Di-n-octyl phthalate Di-n-octyl phthalate Di-n-octyl phthalate Bist2-chloroethoxene Di-n-octyl phthalate Di-n-octyl phthalate Di-n-octyl phthalate Di-n-octyl phthalate Bist2-chloroethoxene Hexachloroethane Indenol I, 2, 3-C, Dlpyrene Indenol I, 2, 3-C, Dlpyrene Isophorone N-Nitrosodiphenylamine N-Nitrosodiphenylamine Nahhalene Nahhalene Nahhalene	Phenanthrene Phenol Pyrene Mercucy	Arsenic	Selenium	Lead Aluminum Antimony Barium Beryllium Cadmium Calcium	
Method	1	LM25 LM25 LM25	B9	1020	JD21 JS12 JS12 JS12 JS12 JS12 JS12	
Depth	000000000000000000000000000000000000000	0.00	0.0	0:0	0 000000	
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QC Test Code De				•		
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QC Test Code			•		Z g g g g	
Data QC Test Quals Code			•		Z	
Flag Data QC Test Code Quals Code	ATM ATM ATM ATM ATM ATM ATM ATM ATM ATM		ATSX	ATSZ	Z g g g g	
Flag Data QC Test Lot Code Quals Code	07/1095 ATMU	ATM ATM ATM	07/10/95 ATSX	ATSZ	ATSY B ATRX B ATRX B ATRX B ATRX B ATRX ATRX	
Sample Flag Data QC Test Date Lot Code Quals Code	STSW 07/1095 ATMJ	07/10/95 ATMJ 07/10/95 ATMJ 07/10/95 ATMJ	XTA 6/01/10 WSTS	07/10/95 ATSZ	07/10/95 ATRY B 07/10/95 ATRX B 07/10/95 ATRX B 07/10/95 ATRX 07/10/95 ATRX 07/10/95 ATRX	
Note Sample Flag Data QC Test Type Date Lot Code Quals Code	CSE STSW 07/1095 ATMJ	STSW 07/10/95 ATMJ STSW 07/10/95 ATMJ STSW 07/10/95 ATMJ STSW 07/10/95 ATMJ	CSE STSW 07/10/95 ATSX	CSE STSW 07/10/95 ATSZ	STSW 07/10/95 ATRY B STSW 07/10/95 ATRX B STSW 07/10/95 ATRX B STSW 07/10/95 ATRX B STSW 07/10/95 ATRX STSW 07/10/95 ATRX STSW 07/10/95 ATRX	

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Unit Meas	990 990 990 990 990 990 990 990 990 990	990 900 900 900 900 900 900 900 900 900
Meas Value Bool	11.900 3.550 14.900 1,370.000 506.000 11.300 784.000 0.803 LT 107.000 34.300 LT 17.900 83.600	2.000 LT
Compound Name	Chromium Cobalt Coper Iron Magnesium Manganese Nickel Potassium Silver Sodium Thallium Vanadium	1,2,4-Trichlorobenzene 1,2-Dichlorobenzene 1,4-Dichlorobenzene 2,4,5-Trichlorophenol 2,4-Dichlorophenol 2,4-Dinnethylphenol 2,4-Dinitrophenol 2,4-Dinitrophenol 2,4-Dinitrophenol 2,4-Dinitrophenol 2,4-Dinitrophenol 2,4-Dinitrophenol 2,4-Dinitrophenol 2,4-Dinitrophenol 3,4-Dinitrophenol 2-Methyl-4,6-dinitrophenol 2-Methyl-4,6-dinitrophenol 3-Nitroaniline 2-Nitrophenol 3-Nitroaniline 4-Bromophenylphenyl Ether 4-Bromophenylphenol 3-Jichlorobenzidine 3-Methyl-4-Chlorophenol 3-Nitroaniline 4-Bromophenylphenol 4-Nitrophenol Acenaphthylene Bromophenylphenol 4-Nitrophenol Acenaphthylene Bromophenylphenol Bromophenylphenol Bromophenylphenol Acenaphthylene Bromophenylphenol Acenaphthylene Bromophenylphenol Bromophenylphenol Acenaphthylene Bromophenylphenol Bromophenylphenol Bromophenylphenol Bromophenylphhalate Bromophenylphhalate Din-octylphhalate Dibenzofuran Diethylphhalate Fluoranthene Fluoranthene
Method	1812 1812 1812 1812 1812 1812 1812 1812	LM25 LM25 LM25 LM25 LM25 LM25 LM25 LM25
Depth	000000000000000000000000000000000000000	
OC Test Code		
Data Quals	H	
Flag Code	ява в вве В в в в в в в в в в в в в в в в в в в в	œ
Lot	ATRX ATRX ATRX ATRX ATRX ATRX ATRX ATRX	ATIMU
Sample Date	07/10/95 07/10/95 07/10/95 07/10/95 07/10/95 07/10/95 07/10/95 07/10/95	9710955 9710955
Site Type	STSW STSW STSW STSW STSW STSW STSW STSW	STSW STSW STSW STSW STSW STSW STSW STSW
Media Type	<b>8888888888888888888888888888888888888</b>	22 22 22 22 22 22 22 22 22 22 22 22 22
Field Sample No.	DX250200	DX250200
Site ID	SSD-95-25B SSD-95-25B SSD-95-25B SSD-95-25B SSD-95-25B SSD-95-25B SSD-95-25B SSD-95-25B SSD-95-25B SSD-95-25B SSD-95-25B SSD-95-25B SSD-95-25B	SSD-95-25B

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w				
Unit	990 990 990 990 990 990 990 990 990 990	ngg	ngr	NGF
Meas Bool	0.800 LT 25.000 LT 25.000 LT 25.000 LT 10.000 10.000 LT 7.000 LT 7	0.074	397.000	110.000
Value				
Compound Name	Hexachlorobenzene Hexachlorobutadiene Hexachlorocyclopentadiene Hexachlorocthane Hexadecanoic acid / Palmitic Indeno[1,2,3-C,D]pyrene Isophorone N-Nitrosodi-n-propylamine N-Nitrosodiphenylamine N-Nitrosodiphenylamine Naphthalene Nitrobenzene Octadecanoic acid / Stearic Pentachlorophenol Phenanthrene Phenol	Mercury	Total Petroleum Hydrocarbons	Total Petroleum Hydrocarbons
Method	LM25 LM25 LM25 LM25 LM25 LM25 LM25 LM25	λ <sub>9</sub>	4181	4181
Depth	000000000000000000000000000000000000000	0.0	0.0	0.0
QC Test Code				
Data Quals				
Flag Code	o o			
Lot	ATM ATM ATM ATM ATM ATM ATM ATM ATM ATM	ATQB	ATRB	ATRB
Sample Date	07/10/95 07/10/95 07/10/95 07/10/95 07/10/95 07/10/95 07/10/95 07/10/95 07/10/95 07/10/95	07/10/95	WELL 07/10/95	WELL 07/10/95
Site Type	STSW STSW STSW STSW STSW STSW STSW STSW	STSW	WELL	WELL
Media Type	SS	CSE	CGW	CGW
Field Sample No.	DX250200	DX250200	GXUT0100	GXUT0200
Site ID	SSD-95-25B SSD-95-25B SSD-95-25B SSD-95-25B SSD-95-25B SSD-95-25B SSD-95-25B SSD-95-25B SSD-95-25B SSD-95-25B SSD-95-25B SSD-95-25B SSD-95-25B SSD-95-25B SSD-95-25B SSD-95-25B SSD-95-25B SSD-95-25B SSD-95-25B SSD-95-25B	SSD-95-25B	UST-01	UST-02

Appendix B: Field Sampling Forms - Supplemental Sampling Event

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		Well No. UST-01		
	<b>Monitoring Well Sampling</b>	Client		
Arthur D Little		Project		
	Data Sheet	Case No		
		Case 140.		
Date Sampled: 7/11/95	Sampled By: C. Nayer	_ Z/OLUCATION A GAR		
Depth to Water: 17.69	$\sim$ $\sim$ $\sim$ $\sim$ $\sim$	Project Case No.  LOCATIONUSTATION  A COLUMN TO THE PROJECT TO THE		
		W 1 1 1 1 2 2 3 1 1 1 1 1 1 1 1 1 1 1 1 1		
$O_2$ LE	L PID Oppm	is are vistor		
Measuring Point: Note	h on PYC	_   N		
Equipment: Bailer		5 parking		
WELL VOLUME (* u	se appropriate values in table for each code let	ter)		
		Gallons of Water		
V well	Depth Screen Bottom Depth Water  x [ ( 26.33 - 17.61 ) ]=	(well)		
0.17	* [ (L. K.) -			
<b>ANNULAR VOLUME</b>	(ASSUME 30% POROSITY)			
V annulus	Depth Depth Screen Bottom Bottom of Seal_	Gallons of Water (annulus)		
7 annulus	x [( 26.33 - 17.69 )]=	6.83		
TYLED MO DE DEM				
WATER TO BE REMO	ter Gallons of Water Removal	Gallons to Actual Gallons Removed Removed		
(well)	(annulus) Multiplier De F	Removed Removed		
[([1.47				
WELL PURGING ME		Well Annulus		
Time Gallons	pH Conductivity Turbidity DO Tempe			
Removed 1.5	5.9 1.0 10 1.4 13	1.5" 0.10gal/ft 4.0 0.29gal/ft		
	0.0 1.0 110 0.8 13	6.5 0.46gal/ft		
1024 5	5.8 1.0 200 0.1 13 1.1 190 0.0 13	2" 7.25 0.59gal/ft		
10.37 - 14	0 1.1 200 1.5 13	0.17gal/ft 7.75 0.69gal/ft 8.25 0.79gal/ft		
050 24	5 1.2 30 4.6 13 6 13 42 43 13	8.25 0.64gal/ft		
1402 44	11 20 43 14	4" 10.25 1.06gal/ft		
Post Sampling		12.25 1.03gaVi		
1444 46	6.6 1.1 battery died on Horib	1.5gal/ft 12.25 1.41gal/ft		
	· · · · · · · · · · · · · · · · · · ·			
SAMPLING	•			
	Volume Filtered	G Time		
Sample ID Analysis	(ml) (Y/N) Preservation H2SO4	Container Time  Amber glass 1440		
GIXUTO100TPH		amor gras-		
Notes (include data on f	loaters/sinkers with measuring device, well con	ndition, etc.)		
	d 0 instead of B. But Honba Calibrat	a.c.		
Lunch break 1135 - 12	40. Well dry cut 406 removed.			
* Assumes 30% porosity				
Signature (a	colyn Maya Date 7-11-95	No. of Bottles		
o.g				
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			W	ell No. U.	ST-02	
	Data Sheet			Client USAEC		
<b>Arthur D Little</b>				Project Ft. Dewens		
	Data				2065-	
Date Sampled: 7/11/95	Sampled By: 7	vesper, C.M.	wer	LOCA	Ka Denoit	
			yer	y   y	03:01 30	
Depth to Water: 19.89				1 BA	or 40	
$O_2$ LH		PID Oppm	-	30.00	a55-01	
	hon PVC			刻	parking	
Equipment: grandfose WELL VOLUME (* u	w/generator,	then bailer	7 -44		Parking	
WELL VOLUME (* u	se appropriate values ir	table for each code	Gallor	ns of Water		
${f V}$ well	Depth Screen Bottom	Depth Water		(well)	ļ	
0.17	x [( <u>29.32</u>	<i>-</i> [19.89')	]=	.60		
ANNULAR VOLUME	(ASSUME 30% PO	ROSITY)	Calle	ns of Water		
V annulus	Depth Screen Bottom	Depth Bottom of Seal_		nnulus)		
0.79	x [ ( 29.32	- 19.89 )	$= \frac{7}{1}$	45		
WATER TO BE REM	OVED	ъ То	otal Gallons	to A	ctual Gallons	
Gallons of Wa (well)	ater Gallons of Water (annulus)	Kemovai -	be Removed	<u> </u>	Removed	
· [( 1.60 ·	+ 7.45	)]x <b></b> =	45.2	<u> </u>	15.25	
WELL PURGING ME	EASUREMENTS			Well	Annulus	
Gallons Time Removed	pH Conductivity Tur	bidity DO Ter	nperature	V well	dia V annulus	
1320 0.5	7.5 0.52 9	70 - 1.7 -	14	0.10gal/ft	4.0 0.29gal/ft	
1333 _ 7 _	7.3 <u>0.37</u> 9	76	<i>14</i>	2#	6.5   0.46gal/ft 7.25   0.59gal/ft	
			<u> </u>	2 0.17gal/ft	7.75 0.69gal/ft	
					8.25   0.79gal/ft 8.25   0.64gal/ft	
				4"	10.25 1.06gal/ft	
				U.oogal/it	12.25 1.63gal/ft	
Post Sampling NA - Honbak	attern died -			6" 1.5gal/ft	12.25   1.41gal/ft	
Not in the second						
SAMPLING						
	Volume Filtered	Preservation	Co	ntainer	Time	
Sample ID Analysis	(ml) (Y/N)	H2504		per glass	1440	
				<u> </u>		
Notes (include data on f	loaters/sinkers with me	asuring device, well	condition	ı, etc.)		
Generator was not u & Turbidity readings At 1333, well want any.	brking, so bailed.	nd, not sure	why, It	calibra	ted fine.	
At 1333, well want day.	At 1350 returned	bailed total of	154, U	sell dry.	Waited tor	
* Assumes 30% porosity	narge and sample	71. 1		A.D	, .	
Signature (a	colen mayer	_ Date <u>/////</u>	No.	of Bottles		
	0		-			
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	· · · · · · · · · · · · · · · · · · ·		W	ell No. G	E-01	
	Monitoring Well Sampling		g C	Client USAEC		
Arthur D Little			P	Project		
			C	ase No. 6	7065-	
Date Sampled: 7/11/9	Sampled By	:D. Vesper, C. Mo	yer	* LOGA	TION 260	
Depth to Water: 20.17					3	
	<u> </u>	Into O		V K	12	
$O_2$ LF		PID Oppm		Dr.	& part	
Measuring Point: Note	h on PVC			OF.	* 1	
Equipment: paike				dut/grass	7	
WELL VOLUME (* u	se appropriate value	s in table for each code	e letter)	ons of Water		
$\mathbf{V}$ well	Depth Screen Botto	om Depth Water		(well)		
0.17	x [(21.89'	] - [20.17])	]=	, କ୍ଷ		
ANNULAR VOLUME	(ASSUME 30%)	POROSITY)				
V annulus	Depth Screen Botto	Depth		ons of Water annulus)	•	
0.19	x [ (21.89'		]=	1.36		
WATER TO BE REM	OVED	,			Actual Gallons	
Gallons of Wa		er Removal <sup>1</sup> <u>Multiplier</u>	otal Gallon be Remove	3 10	Removed	
(well)	+ 1.36	])]x 5 = [	8.24		2.70	
WELL PURGING MI	EASUREMENTS			Well	Annulus *	
Time Gallons Removed	pH Conductivity	Turbidity DO Te	emperature	V well	dia V annu	
0933 0.5 (	0.34 0.33	744 R.26	12.7	0.10gal/ft	4.0 0.29gal	
0942 a	0.30 0.32 _	540 5.8	14.0	1	6.5 0.46gal 7.25 0.59gal	
				2" 0.17gal/ft	7.75 0.69gal	
					8.25 0.79gal 8.25 0.64gal	
				4" 0.66gal/ft	10.25 1.06ga	
Post Sampling		,		6"	12.25   1.63gal	
NA - Battay E	n Horiba diec	/		1.5gal/ft		
SAMPLING						
SAMPLING	Volume Filter	red				
Sample ID Ana <u>lys</u> is	(ml) (Y/I	N) Preservation		ontainer <b>Eralass</b>	Time 1 <b>530</b>	
Sample ID Analysis  GXGE0300 TPH	<u> </u>	3 <u>Ita Sou</u>	_ um	er gass		
					_	
Notes (include data on	loaters/sinkers with	measuring device, wel	l conditio	n, etc.)	+ 2G	
Notes (include data of the No inside Puc cap. In At 1340, boiled 426,	inally water cus	vay, chunks at b	o <del>uorr</del> i, w	en ury w		
	, · J					
* Assumes 30% porosity	.1 70	Data Ministra	N <sub>O</sub>	o. of Bottles	/	
Signature <u>M</u>	Kyn Mayes	Date _ <b>7/11/95</b>	140	. Vi Dutties		
		•	•			

Λrthur D Little	Monitoring Well Sampling Data Sheet			ient US/ oject use No. 67	1065 ·
Date Sampled: 7/11/99		C. Mayer	43	LOCA	TION 2602
Depth to Water: 13.8	7 Total Depth:	21.85		र्व देश सर	_
$O_2$ / LI	EL /	PID Oppm	LE CE	2	vira
Measuring Point: Note	h on PVC			4/ 1/2 -	parking
Equipment: bailer		' to ble for each god	gr	ass 1	
WEEL VOLUME	se appropriate values  Depth Screen Botton		Gallo	ns of Water (well)	
V well 0.17	x [ ( 21.85	- 13.89		35	
ANNULAR VOLUME V annulus	Depth Screen Botton	m Bottom of Seal	(a	ns of Water nnulus)	
WATER TO BE REMOGAILORS of Ware (well)	OVED  iter Gallons of Water (annulus)  + 6.29		Total Gallons be Removed 38.19	to '	Actual Gallons Removed
WELL PURGING MI				Well V well	Annulus * dia V annulus
Time Gallons Removed	pH Conductivity T	Turbidity DO To 14 1.4 1.500 0.8	emperature 12 12	1.5" 0.10gal/ft	4.0 0.29gal/ft 6.5 0.46gal/ft
				2" 0.17gal/ft	7.25   0.59gal/ft 7.75   0.69gal/ft 8.25   0.79gal/ft
				4" 0.66gal/ft	8.25   0.64gal/ft 10.25   1.06gal/ft 12.25   1.63gal/ft
Post Sampling  NA  —————————————————————————————————				6" 1.5gal/ft	12.25 1.41gal/ft
SAMPLING	Volume Filtere	•	Co	ontainer	Time
Sample ID Analysis Sign TPH	(ml) (Y/N	H2504		erglass	<u> 1530</u>
Notes (include data on it turbidity reading of Colbrated corre	was 140, aon't K	HOW WAY !! ITEMS	·		s opposed to
b. Calibrated correctives west went dry at 0948, * Assumes 30% porosity total	Drad lange to	brown. No odoro again. Sampled	orsheen. After ne	recharge	. We is a book
	Olyn mayer	Date 7/11/9	5 No.	of Bottles	

		Wel	INO GE-	۸3
Monitoring	Monitoring Well Sampling			
		Dro		
Data Sheet				
			L L A	77) - N E
Sampled By	D. Vesper C.A	nayer &	LOUATIO	N # 2607
		Ç	6 Y 650	" <b>a</b>
	DID A	1.,	[S] \$	०ईर-०१
L /	PID Oppm		- 6 B L	
la on PVC			N. I	parking
		Live	. 1.71	
o oppropriate value	s in table for each co	de letter)	J	
e appropriate value	s in table for each co	Gallons	of Water	
	Depth Water			
x [ ( 26.90	] - [14.19]	)]= <u>la</u>	.88	
(ASSLIME 30% I	POROSITY)			
	Depth			
x [ ( <u>26.90</u>	. 15.5	)]= [	.01	····
OVED		Total Gallone to	Actua	ıl Gallons
ter Gallons of Wate		be Removed	Re	moved
	$7)1 \times 5 = 5$	109.43	]	33
			Well	Annulus *
	mLidier DO	Temperature		
-	2		1.5"	
	850 40		1	, –
0.9 0.31	990 1.3		<u> </u>	
	940 2.1		8.2	
7.3 0.31	990 2.7	13		5   0.64gal/fi 25   1.06gal/fi
<u> 2.8 0.31 </u>	<u> 440 _ 5,/_</u>		0.66gal/ft 12.2	
			6" 12.2	25 1.41gal/f
iea - NA-			1.5gal/ft	
	3			
Volume Filter	J) Preservation		tainer	Time
Volume Filter (ml) (Y/N	N) Preservation	_amb	er glass .	1500
(ml) (Y/N 	Preservation Hawa HN03	amb	er glass plastic .	1500
(ml) (Y/N 11 A 500 ml N 125 ml N	Preservation Hassey HN03 ICE	ombo clear clear	er glass plastic plastic	1500 1500
(ml) (Y/N 500ml N 125 ml N 5125 ml	Preservation Howy HN03 ICE ICE	amb clear clear	er glass plastic plastic plastic	1500
(ml) (Y/N 11 A 500 ml N 125 ml N	Preservation Hassey HN03 ICE	amb clear clear	er glass plastic plastic	1500 1500 1500
(ml) (Y/N 500ml N 125 ml N 5125 ml	Preservation Howy HN03 ICE ICE	amb clear clear	er glass plastic plastic plastic	1500 1500 1500
(ml)	Preservation HoSoy HN03 ICE ICE HaSoy	Ombo Clear Clear Clear Ambo	er glass plastic plastic plastic plastic	1500 1500 1500 1500
(ml) (Y/N  500ml N  125 ml N  125 ml N  125 ml N  11L N	Preservation HoSO4 HN03 ICE ICE HaSO4  measuring device, w	Ombo Clear Clear Clear Ambo	er glass plastic plastic plastic plastic	1500 1500 1500 1500
(ml) (Y/N  125 ml N  125 m	Preservation Howa Howa Howa Howa Howa Howa Howa Howa	Clear	er glass plastic pla plastic plastic plastic plastic plastic plastic plastic plastic p	1500 1500 1500 1500 1500
(ml) (Y/N  125 ml N  125 m	Preservation Howa Howa Howa Howa Howa Howa Howa Howa	Clear	er glass plastic pla plastic plastic plastic plastic plastic plastic plastic plastic p	1500 1500 1500 1500 1500
loaters/sinkers with water, well do nows 0 instead of the control	Preservation Howa Howa Howa ICE ICE Hasoy  measuring device, w y at the Uess the sample. I Don't Know  Market Complement of Don't Kn	ell condition	er glass plastic plast	1500 1500 1500 1500 1500
(ml) (Y/N  125 ml N  125 m	Preservation Howa Howa Howa Howa Howa Howa Howa Howa	ell condition	er glass plastic pla plastic plastic plastic plastic plastic plastic plastic plastic p	1500 1500 1500 1500 1500
	Sampled By:  Total Depth  Total Depth  Por PVC  e appropriate values  Depth Screen Botto  x [ (26.90  (ASSUME 30% I  Depth Screen Botto  x [ (26.90  VED  er Gallons of Wate	Sampled By: D. Ws per C. N.  Total Depth: 26.90  PID Opport  e appropriate values in table for each co  Depth Screen Bottom  X [ (26.90 - 14.19  ASSUME 30% POROSITY)  Depth Bottom of Seal  X [ (26.90 - 15.5  Depth Screen Bottom  X [ (26.90 - 15.5  Depth Bottom of Seal  ASUREMENTS  PH Conductivity Turbidity DO  Depth Conductivity DO  Depth Conductivity Turbidity DO  Depth Conductivity Turbidity	Monitoring Well Sampling Data Sheet    Sampled By:   Vesper   C.Mayer	Sampled By:   Nesper   C. Mayer   Logaria   Logaria

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Arthur <b>D</b> Little	Surface Water/ Sampling Dat	<b></b>		-10-95 LSAZ C +. Devens 67065				
LOCATION Sampling Location Discription Storm Sewer System 9D Type Of Water Body Channel Width Channel Depth Est. Flow Discharge Points (Y/N) Location Odors, Surface Sheen								
LOCATION DIAGRAM (Indicate orientation, sampling locations, discharge/recharge points, etc.)  No water. Lot of organic matter, Itaves, pine needles sand and sitt. Sample								
How 15		<b>c</b> ediment	۲.					
Equipment Used (Calibrat Solvent 1 Used Light) Decontamination Procedure	ed Y/N) Runar Erra Solvent 2 Used —	b Sampler	- <b>£ S S C t</b> Other	2000 + Bow)				
DI Water Rinse Solvent 1 Rinse Solvent 2 Rinse Solvent 1 Rinse DI Water Rinse	DI Water Rinse Solvent 1 Rinse DI Water Rinse	Detergent V DI Water R		Other				
GROUND WATER CH	ARACTERISTIC  COND D.O.	FREE CL <sup>-</sup> Y/N	TURB	TIME				
SAMPLING  SAMPLE MATR  DXO90400 CSA	E Pest/PCB 400	(Y/N) - N	PRESERV.	TIME				
NOTES								
Signature Censlyn	haye Date	7-10-55 No. (		2 of				

Λrthur D Little	Surface Water/Sediment Sampling Data Sheet  Date 7-10-95 Client US AEC Project F1. Devens Case No. 67065						
Type Of Water Body	otion Cold Spring Broo From moutin of Ponded 5' Channel Depth 41'	Est. Flow	medium ti				
LOCATION DIAGRA	M (Indicate orientation, sampling loc	Liberat of brook direct summer on s	Samples but 10 fm K. Sw sar Hy in bo ples collec	etc.)  ( collected  ( collected  ( pm mouth of  nples collected  Hile. Sectionand  Hed from bank  ox where  ad accomulated			
SAMPLING PROCEDURE  Equipment Used (Calibrated Y/N)  Solvent 1 Used Lqutnox  Solvent 2 Used  Decontamination Procedures Used  DI Water Rinse  Solvent 1 Rinse  Solvent 1 Rinse  Solvent 1 Rinse  DI Water Rinse							
GROUND WATER CH	COND D.O.	FREE CL <sup>-</sup> Y/N	TURB	TIME			
(UX09U8X ) CS WX09U8X   CS WX09U8X   CS WX09U8X   CS WX09U8X   CS WX09U8X   CS	AIL/Anion 125ml W F. Met W Met/Hard IL W Rest/FCB BX IL W SVOC DX IL W TOC 250ml W TPH IL W TSS 125ml E REST/FCB 402	FILTERED (Y/N)  V  N  N  N  N  N  N  N  N  N  N  N  N	PRESERV.  ICC.  HNOZ  HNOZ  ICC.  ICC.  ICC.  H2-SOY  ICC.  ICC.	TIME  1615  1615  1615  1615  1615  1615  1615  1625  1625			
NOTES  DXO90800 CS  DXO90800 CS		22	ice	1625 1625			

Date <u>7-10-95</u> No. Of Bottles

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Arthur D Little		ter/Sediment Data Sheet	Date 7-10-95 Client USAEC Project F+. Devens Case No. 67065			
LOCATION Sampling Location Discription  Cold Spring Brook, 9T  Type Of Water Body  Edge of Brook Channel Width  Bischarge Points (Y/N) Location  Odors, Surface Sheen  LOCATION DIAGRAM (Indicate orientation, campling locations, discharge/recharge points, etc.)  Collected surface water  with a cup, about 3-4' from edge of Stream 0-2' and scooping  Sediments -35' from edge with SS  Spoon 1-bow) about 0-14' deep.  Sediments very organic (mucky)						
SAMPLING PROCED Equipment Used (Calibrat Solvent 1 Used Liquida) Decontamination Procedu  DI Water Rinse Solvent 1 Rinse Solvent 2 Rinse Solvent 1 Rinse DI Water Rinse	Sed Y/N) Stain Less S L Solvent 2 Use res Used  DI Water Rin Solvent 1 Rins DI Water Rin	se Detergent W	Other Other			
GROUND WATER CH	IARACTERISTIC  COND D.0	FREE CL <sup>-</sup> O. Y/N	TURB TIME			
SAMPLING  SAMPLE  WX0909X1  WX0909X1  WX0909X1  WX0909X1  WX0909X1  WX0909X1  WX0909X1  CSC  WX0909X1  CSC  WX0909X1  CSC  WX0909X1  CSC  WX0909X1  CSC  TX090900  CSC	METHOD  BIK/Phion  F. Metals  W Heat/Pord  W SYOC  W TOC  W TSS  E PEST/PCB	OLUME FILTERED  (ml) (Y/N)  135 ml  U  U  U  U  U  U  U  U  U  U  U  U  U	PRESERV. TIME  1CC 1445  1408 1445  1408 1445  1CC 1445  1CC 1445  145  145  145  145  145  145  145			
NOTES  DEOGOGO  DEOGOGO  CS	E TPH E Metals	402 jar N 402 jar N	ice 1445			
Signature ( avoly	mayer	Date <u>7-10-95</u> No.	Of Bottles <u>/5</u> Page <u>/</u> of <u>/</u>			

Λrthur D Little	1	ater/Sediment g Data Sheet	Client C Project F	-10-95 SAEC. -t.Davans 67065
LOCATION Sampling Location Discri Type Of Water Body S Channel Width 5-7 Discharge Points (Y/N) I	Channel Depth	<u>~3′</u> Est. 1		
Odors, Surface Sheen LOCATION DIAGRAMONA St	Employed Jorde	bottle. So take san taken of water in flowing on south	water taken cumpler wadla upple w/wade u5' from cu u5' from cu u5 water. Sed un bank of	ts,etc.) Alrectly Into Into brook to rs on. Samples Alvert, In mide bout 1' down samples take, CSB, no water f ank. Lot of on, sand, Used SS
SAMPLING PROCEJ Equipment Used (Calibra Solvent 1 Used Liquin Decontamination Procedu  DI Water Rinse Solvent 1 Rinse Solvent 1 Rinse DI Water Rinse DI Water Rinse	OURE  Ited Y/N) Staunies  Solvent 2 U  Ires Used  DI Water R  Solvent 1 R  DI Water R	span For	Spoon, be Other Other Gent Wash ater Rinse	Seauritud Saint
GROUND WATER C		FREE CL <sup>-</sup>	TURB	тіме
SAMPLING  SAMPLE MAT  WXO9IOX I  CS	AIL/Anions  WE E. Mutals  We have / Hard  We have / PCB  W TOC  W TOC  W TSS  W All Same  W Metals, TP	VOLUME FILTER (ml) (Y/N  125 N  1000 Y  1000 N  2 x 1000 N  250 N  1000 N  125 N	PRESERV.  ICC HN03 HN03 ICC ICC ICC ICC ICC ICC ICC ICC ICC IC	TIME  1335  1335  1335  1335  1335  1335  1335  1335  1335
NOTES  DX09/0X/ CS  DX09/0X/ CS		402 N 402 N	ice ice	1350 1350
Signature Carolyn	mayer	Date		27 age / of/

Arthur D Little	Surface Wate Sampling D		Date 7-10-95 Client USNEC Project Ft. Devens Case No. 47045				
LOCATION Sampling Location Discription Cold Spring Brook 9K  Type Of Water Body Storm Sewer System outfall in Cold Spring Brook Channel Width ~ 4-5' Channel Depth ~3' Est. Flow Slow Discharge Points (Y/N) Location							
Odors, Surface Sheen Sheen  LOCATION DIAGRAM (Indicate orientation, sampling locations, discharge/recharge points, etc.)  Sheen apparent in water.  water collected in top of water cowmn (in order to sample sheen). Sediments sampled at 0-6".  Dakota St.  Barnum la							
SAMPLING PROCEDURE  Equipment Used (Calibrated Y/N)  Solvent 1 Used							
GROUND WATER CI	HARACTERISTIC cond d.o.	FREE CL <sup>-</sup> Y/N	TURB TIME				
WX0911X1 C. WM0911X1 C. WM091X1 C. WM091X1 C. WM091X1 C. WM091X1X C. WM091X1X C. WM091X1X C. WM091X1X C. WM091X1X C. WM09X1X	RIX METHOD ( SW AIK/Anions A SW Metals/Hard A SW F. Metals A SW SYOC AX SW TOC A SW TOC A SW TPH 10 SW TSS/ACB A SW TEST/ACB A	(1000 N (1000 N	PRESERV. TIME    (<   1125     1125				
NOTES DX091100 CS DX091100 CS DX091100 CS Signature CALOL	E Pest/PCB  E Metals  E TPH/TOC	HOZ N HOZ N HOZ N AOZ N Date <u>7-10-95</u> N	104 1135 104 1135 104 1135 104 1135 0. Of Bottles <u>AO</u>				

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Arthur D Little	Surface Water/Sed Sampling Data S	Date 7-10-95 Client USAEC Project Ft. Devens Case No. 67065				
LOCATION Sampling Location Discription Cold Spring Brook, 9L  Type Of Water Body Out-fall into stream Channel Width ~4-5' Channel Depth O' Cate Est. Flow NA  Discharge Points (Y/N) Location Odors, Surface Sheen						
Dakota St	Barriero Pa	compled se	aiment a butside ou decompose me. plastic	Hfall. Lot organic Dark		
SAMPLING PROCEDURE  Equipment Used (Calibrated Y/N)  Solvent 1 Used Liquing  Solvent 2 Used  Decontamination Procedures Used  DI Water Rinse  Solvent 1 Rinse  Solvent 1 Rinse  Solvent 2 Rinse  Solvent 1 Rinse  DI Water Rinse  DI Water Rinse  DI Water Rinse  DI Water Rinse						
GROUND WATER CH	IARACTERISTIC COND D.O.	FREE CL <sup>-</sup> Y/N	TURB	TIME		
DX 09 12 00 CO	VOLUME RIX METHOD (ml)  SE Pest/PCB 402  SE SVOC 402  SE TOC 400  SE TPH 400  SE TPH 400  SE TPH 400  SE TPH 400	FILTERED (Y/N)  N N N N N N N N N N N N N N N N N N	PRESERV.  ICC ICC ICC ICC ICC ICC ICC ICC ICC	TIME  1100  1100  1100  1100  1100  1100		
NOTES	•					

Signature Couslys mayer

Date 7-10-45 No. Of Bottles

# Arthur D Little

#### Surface Water/Sediment Sampling Data Sheet

Date	7-10	-95
Client	USA	FC
Project	Ft.	Devens
Case N	0. 6	7045

	Sampling	Data Sneet	Case No. 67065
LOCATION Sampling Location Discrip Type Of Water Body	um sewer o	ntfall	
Discharge Points (Y/N) Lo	ocation		
Odors, Surface Sheen LOCATION DIAGRA	M (Indicate orientation, s	brown silty so	echarge points, etc.) liment moist, dark and, fine-meduting el inside mouth of 5-61 deep to
SAMPLING PROCED Equipment Used (Calibrat Solvent 1 Used Uplus Decontamination Procedur  DI Water Rinse Solvent 1 Rinse Solvent 2 Rinse Solvent 1 Rinse DI Water Rinse	ed Y/N) Stainle  Solvent 2 Use	se Detergent Wasse DI Water Rin	ash Other
GROUND WATER CH	ARACTERISTIC COND D.C	FREE CL <sup>-</sup> O. Y/N	TUDD TOUT
TEMP PH	COND D.C	J. 1/N	TURB TIME
SAMPLING  SAMPLE MATE  DX140100 CS  DX140100 CS  DD140100 CS  DM140100 CS  DM140100 CS  DM140100 CS  DM140100 CS  DM140100 CS	METHOD  E REST/PCB  E REST/PCB	VOLUME FILTERED (ml) (Y/N)  462 N  462 N	PRESERV. TIME  100
NOTES			·
Signature (arolyn)	nayer	Date <u>7-10-45</u> No. 0	Of BottlesPage

# Arthur D Little

### Surface Water/Sediment Sampling Data Sheet

Date '	7-10-95
Client	USAEC
Project	Ft. Devens
	63065

		_			Case No.	07065
LOCATION Sampling Location Type Of Water Bo	n Discription	Storm Seu	er Systen	n 70,	14C	
Type Of Water Bo Channel Width	ody	Channel Dontl	ACC TO U	Fet Flow		
Channel Width — Discharge Points (	TV/NI) I contin	Channel Depu		ESG FIOW .		
Odors, Surface Sh						
				,		oto \
LOCATION DI	AGRAM (I	ndicate orientatio	n sampling loca		N// 143/47CA +	
1 1/3	Will seed al	6144	area area	Course	sand and	d gravel, un, trace of
	CONTRACTOR	Sun Sun	area	light y	ellow/orou	un, trace of -1"drameter
	1.16	12/2		Sample	collected a	about 10' from
	200	200	. )	) deep		
						·
SAMPLING PR	OCEDURE	3				
Equipment Used (	Calibrated V/	n Stames	s steel s	oppo and	Bowl	
Solvent 1 Used	GLIMX	Solvent 2	Used		_ Other	
Decontamination I	Procedures Us	sed				
1 1	ater Rinse	DI Water Solvent 1		Detergent W. DI Water Rin		Other
	nt 1 Rinse nt 2 Rinse	Solvent 1 DI Water	-	DI Water Kii	ise	i l
Solven	it 1 Rinse					
	iter Rinse	CORDICEL	~		· · · · · · · · · · · · · · · · · · ·	
GROUND WAT	ER CHARA	ACTERISTI	· F	FREE CL		
TEMP		COND	D.O.	Y/N	TURB	TIME
NA -						
SAMPLING			VOLUME	FILTERED		1
<b>_</b> . <b>_</b>						
SAMPLE	MATRIX	METHOD	(ml)	(Y/N)	PRESERV.	TIME
SAMPLE <b>DX140300</b>	MATRIX <b>CSE</b>	METHOD  Rest /RCB	402	N	PRESERV.	0830
	MATRIX <u>CSE</u> CSE		• •			= :-
	MATRIXCSECSE		402	N	ice	0830
	MATRIXCSECSE		402	N	ice	0830
	MATRIXCSECSE		402	N	ice	0830
	MATRIXCSECSE		402	N	ice	0830
	MATRIXCSECSE		402	N	ice	0830
	MATRIXCSECSE		402	N	ice	0830
DX140300 DX140300	MATRIXCSECSE		402	N	ice	0830
	MATRIX CSE CSE		402	N	ice	0830
DX140300 DX140300	MATRIXCSECSE		402	N	ice	0830
DXI40300 DXI40300 NOTES	CSE	Pest ACB Metals	402	N	ice	0830
DX140300 DX140300	CSE	Pest ACB Metals	402 402	N	ice	0830

Λrthur D Little	Surface Water/Sediment Sampling Data Sheet  Client USAEC Project F4. Darn Case No. 67065					
LOCATION Sampling Location Discription Storm Sewer System 21A  Type Of Water Body Storm Sewer Outfall into Willow Brook Channel Width 4.5' Channel Depth O no water Est. Flow NA  Discharge Points (Y/N) Location Odors, Surface Sheen						
LOCATION DIAGRAM (Indicate orientation, sampling locations, discharge/recharge points, etc.)  No water. Light brown course sand, trace of fine gravel.  Sample taken 1' promoutfall and about 2-3" deep. willow Brook nas lot of garbage in it (chairs, toys, etc)						
SAMPLING PROCEDURE  Equipment Used (Calibrated Y/N)  Solvent 1 Used Lequipment Used  Decontamination Procedures Used  DI Water Rinse  Solvent 1 Rinse  Solvent 1 Rinse  Solvent 2 Rinse  DI Water Rinse						
GROUND WATER CH	IARACTERIST COND	D.O.	FREE CL <sup>-</sup> Y/N	TURB	TIME	
SAMPLING  SAMPLE MAT  DX 8/0/X/ CS	_	VOLUME (ml)  Yoz	FILTERED (Y/N)  ———————————————————————————————————	PRESERV.	TIME	
NOTES  Signature autly Date 7-10-95 No. Of Bottles						

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Λrthur D Little	Surface V Sampli	Water/Seong Data S		Client U	·10-95 LSBEC H.DEVENS 167065
LOCATION Sampling Location Discrip Type Of Water Body Channel Width Discharge Points (Y/N) Lo	torm Sewe Channel Dept	r Outfa th	2/7 Est. Flow		
LOCATION DIAGRA  Osplatt  Out park		No wo sedim sand o was m	Her. Sam ent. Top and fine ostly silt Sample o	inch wa gravel, u some s	etc.) 6" of so course noteineatl and, some just outsis
SAMPLING PROCED Equipment Used (Calibrat Solvent 1 Used Lique) Decontamination Procedur  DI Water Rinse Solvent 1 Rinse Solvent 2 Rinse Solvent 1 Rinse DI Water Rinse	ed Y/N) Stain Solvent 2	r Rinse	Detergent V	Other Vash	Other
GROUND WATER CH	COND	D.O.	FREE CL <sup>-</sup> Y/N	TURB	TIME
SAMPLING  SAMPLE MATE  DX250100 CS  DX250100 CS  D0250100	E BNA E Metals	VOLUME (ml) 4-2 4-2 4-2	FILTERED (Y/N)  N	PRESERV.	TIME!0!0!0!0!0!0
NOTES Signature Cerolin	mayer	Date つ・	-10-95 No.	Of Bottles	3

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#### Date 7-10-95 Surface Water/Sediment Client USAEC Arthur D Little Project Ft. Devens **Sampling Data Sheet** Case No. 67065 LOCATION Sampling Location Discription Storm Sewer System 25B Type Of Water Body Internal Storm Sower System Channel Depth \_\_\_\_\_ Est. Flow Channel Width \_\_\_\_\_ Discharge Points (Y/N) Location \_\_\_\_\_ Odors, Surface Sheen LOCATION DIAGRAM (Indicate orientation, sampling locations, discharge/recharge points, etc.) No water sediments consisted of organic matter, silt w/ some course sand, lots of pine needles Top 24 of dirt. Dirt was very hard and dry. SAMPLING PROCEDURE Equipment Used (Calibrated Y/N) Rulnar grab campler, SS bowl + spoon Solvent 1 Used Liquinox Solvent 2 Used -**Decontamination Procedures Used Detergent Wash** Other DI Water Rinse DI Water Rinse Solvent 1 Rinse DI Water Rinse Solvent 1 Rinse DI Water Rinse Solvent 2 Rinse Solvent 1 Rinse DI Water Rinse GROUND WATER CHARACTERISTIC FREE CL NA -COND D.O. Y/N рΗ TURB TIME SAMPLING FILTERED VOLUME PRESERV. TIME (Y/N) SAMPLE **MATRIX METHOD** (ml) 0940 402 DX250200 BNA 0940 1250200 Netals D900 ROSH ACB 7900 lce 7900

**NOTES** 

Signature Caroly Mayer

Date 710-95 No. Of Bottles

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